Plastics

DEALING WITH THE MANUFACTURE, USES AND POTENTIALITIES OF PLASTIC MATERIALS

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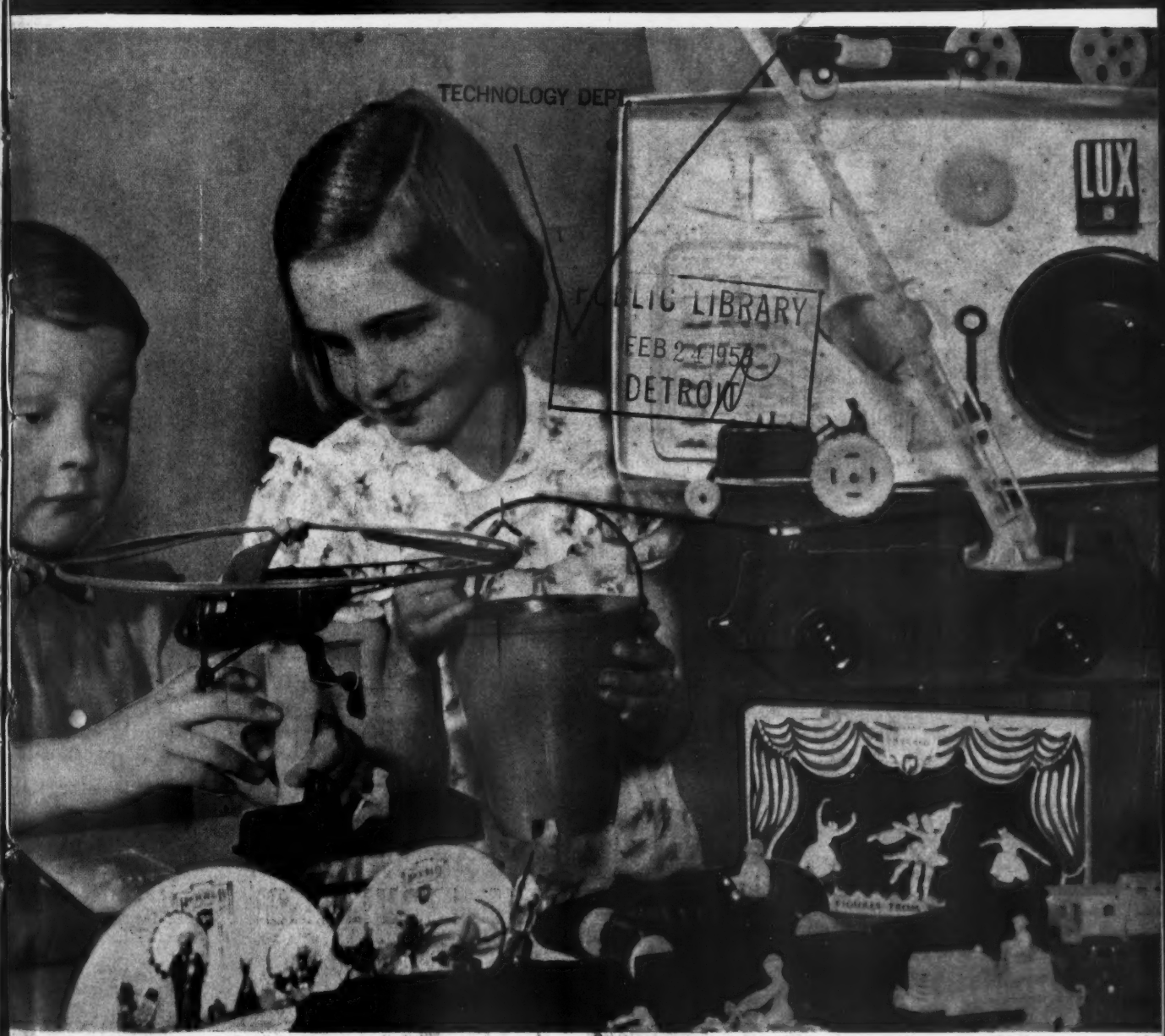

Attractive toys are child's play with Polythene

Polythene is very easy to mould into hygienic, tough and gaily coloured children's toys . . . toys that are light in weight *and will not shatter*. And Polythene toys, being pliable, cannot hurt children if they fall on them.

Polythene has the lowest specific gravity of any plastic in the world and it is now one of the most economical. Polythene was discovered, developed—and is sold under the trade mark 'Alkathene'—by Imperial Chemical Industries Ltd.

ICI

IMPERIAL CHEMICAL INDUSTRIES LIMITED
LONDON, S.W.1.

full marks for finish !

BEXTRENE
REGD.
7101
PRODUCTION
Flowing faster at injection moulding temperatures, BEXTRENE gives up to 25% faster moulding rate; and, of course, the lower specific gravity of Polystyrene means more mouldings per pound.
PROPERTIES
Strongly resistant to water, chemicals and extremes of temperature; outstanding electrical insulation; high dimensional stability; odourless; available in wide range of brilliant colours and crystal-clear transparencies; with high refractive index of both optical and decorative value. Greater resistance to crazing.
USES
BEXTRENE is ideal for all kinds of electrical insulation; for lenses prisms etc.; for laboratory apparatus; for refrigeration equipment; and for an immense variety of ornamental, cosmetic, toiletry and pharmaceutical items.

top marks for toughness!

BEXTRENE Polystyrene Moulding Powder to-day offers not only exceptional economy and speed in production, but a standard of stability, strength and eye-appeal in the finished product which makes it a material in a thousand for both luxury and utility applications. For economy and versatility in mouldings specify:—

BX

BEXTRENE

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POLYSTYRENE MOULDING POWDER

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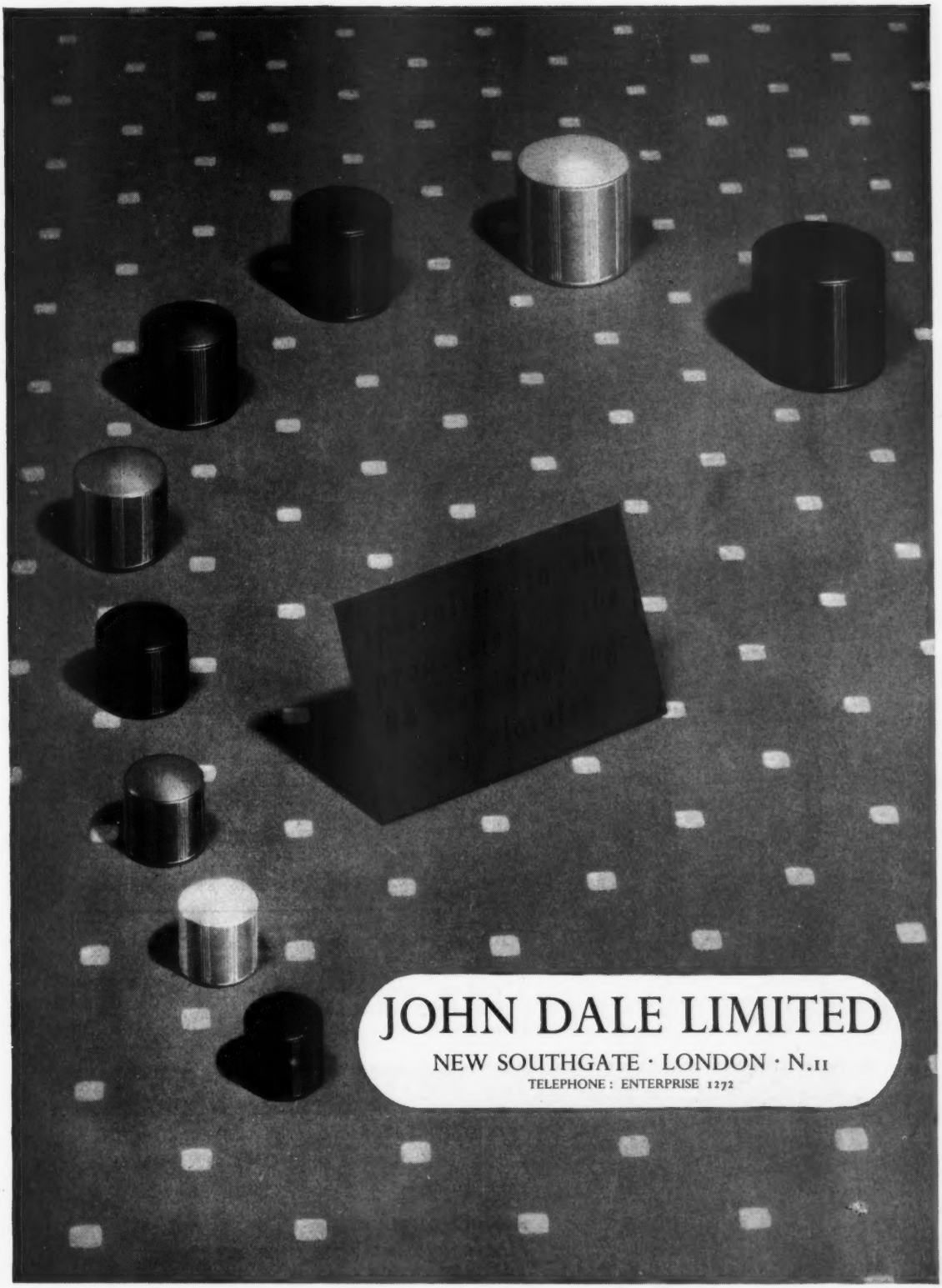
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NYLON AKULON

Moulded AKULON—a super polyamide or nylon —has a number of characteristics which commend its use in an ever increasing field of industrial applications. AKULON has established itself as an Engineering Material of importance and has proved its properties under the most severe conditions. A glance at the following list of its physical and mechanical properties will justify its claim to be among the new versatile materials for construction.

1 Low specific weight;
2 High corrosion resistance;
3 Low coefficient of friction;
4 High wear resistance;
5 Shock absorbing and noiseless in operation;
6 Resistance to low temperatures.

Compared with other Plastics the exceptional characteristics of AKULON *are:*
TENSILE STRENGTH (37,000 lb/sq. inch at break and 9,250lb/ sq. inch as limit of elasticity)
ELONGATION (400%)
HIGH TEMPERATURE RESISTANCE (220° C)
HIGH IMPACT STRENGTH (Izod 2.3 ft lb/sq inch)
SPECIFIC GRAVITY (1.13)

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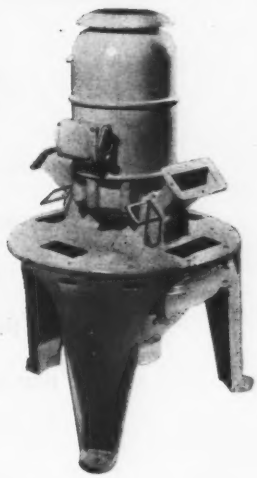
MIX IT WITH THE ENTOLETER

Whatever the mixture you require, there is almost certainly an Entoleter to produce a uniform and intimate blend which is beyond the scope of conventional mixers. Recent successful applications include the blending of :— Moulding compound for gramophone records · Filled phenolic compound for the manufacture of plastic dishes · Filled vinyl moulding compound for the manufacture of storage battery cases, etc. The Entoleter can produce a finished mixture at rates of up to 200 lbs./minute, and is easily incorporated as a final mixer in existing processing systems to cut mixing time, reduce costs and improve product quality. Send for leaflet IP1 describing this machine.



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7612367921
2926

5621
29217586
7678923008
2129765
2345

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9234596
452 5930
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WE do. We work in millions. Moulded Plastics, that is. For example, we mass produce millions upon millions of Platignum Fountain Pens annually. And that same meticulous precision goes into all our intricate mouldings. Our delivery service too, is exceptional; we guarantee the best timetable in the business.

If you have a plastic problem — whether in millions or dozens — we are the people to help you. Send us your enquiry or tell us a convenient time to call.

we are **Mentmore Plastics**

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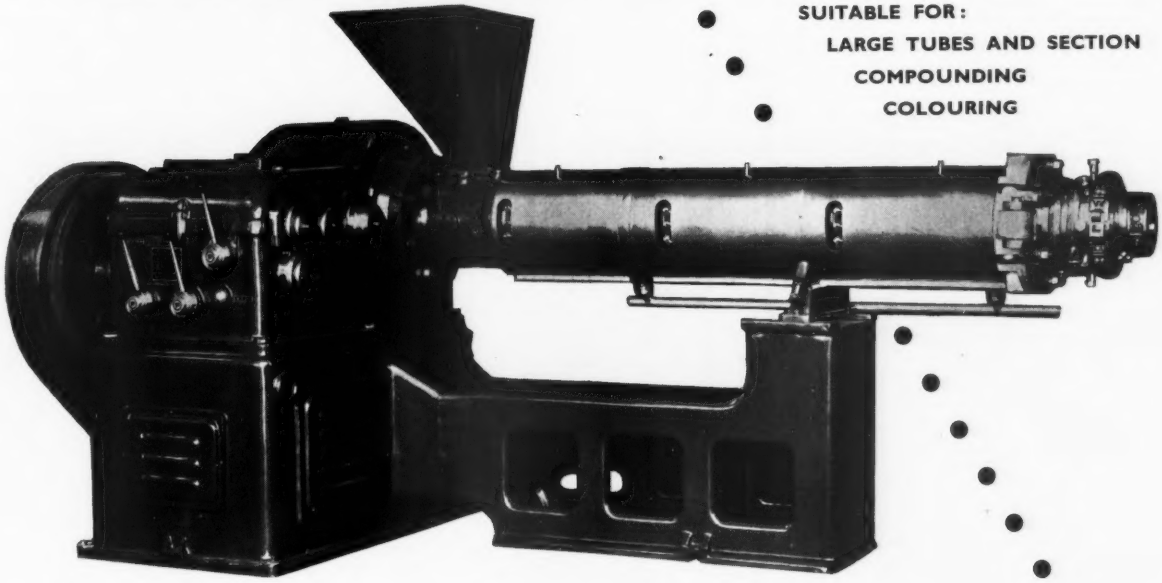
another **Platignum** enterprise

G49

Introducing the new **BANDERA** *Plastics Extruder Range*



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LARGE TUBES AND SECTION
COMPOUNDING
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SPECIFICATIONS OF THE T.120 EXTRUDER (shown on photograph)

Long (17 : 1) 4¾" Screw of Chrome Metal Steel

5 Heating Zones

40 h.p. Motor

12 Speeds

Output: 180 to 220 lb. per hour

No. 3 - 1¼"	dia. screw
T. 45 - 1¾"	,, ,,
T. 60 - 2½"	,, ,,
T. 70 - 2¾"	,, ,,
T. 80 - 3¼"	,, ,,
T. 100 - 4"	,, ,,
T. 120 - 4¾"	,, ,,
T. 160 - 6"	,, ,,

These machines are the lowest priced Extruders offered to British moulders, and can be demonstrated at the London Premises of the SOLE BRITISH DISTRIBUTORS, Industrial Plastics Ltd., who are also Distributors and Suppliers of Take-off Equipment, Granulators, Dicers, Cable Winding and Coiling Equipment.

machinery from **IPL** *Please address your enquiries to the Head Office :*

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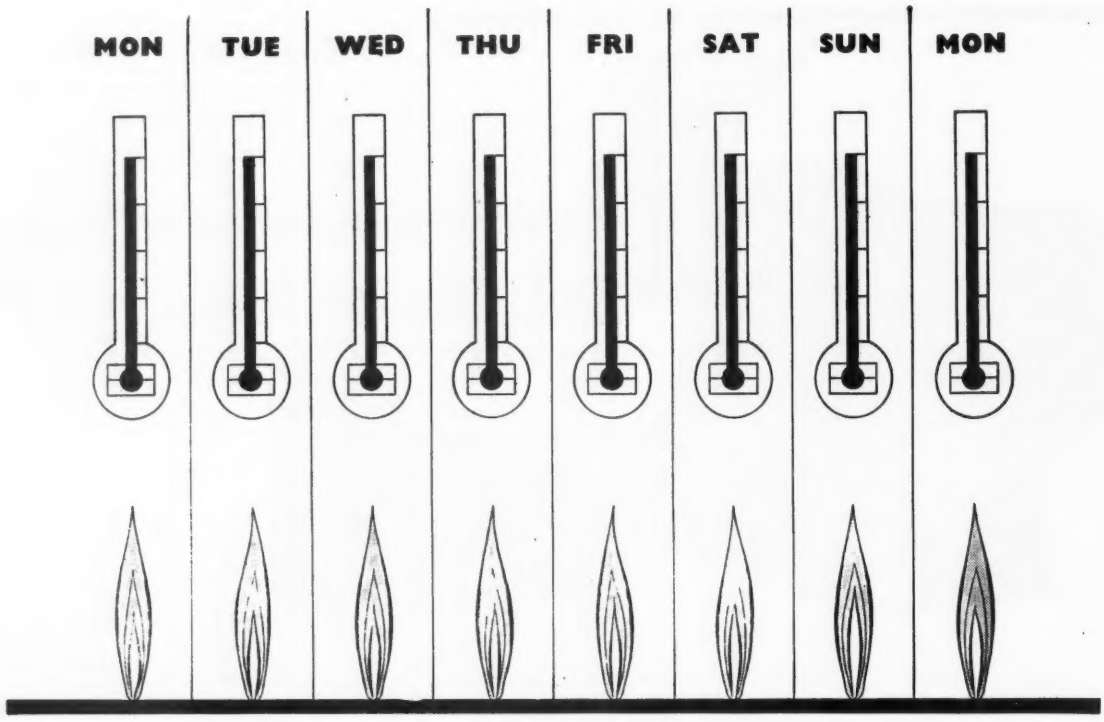

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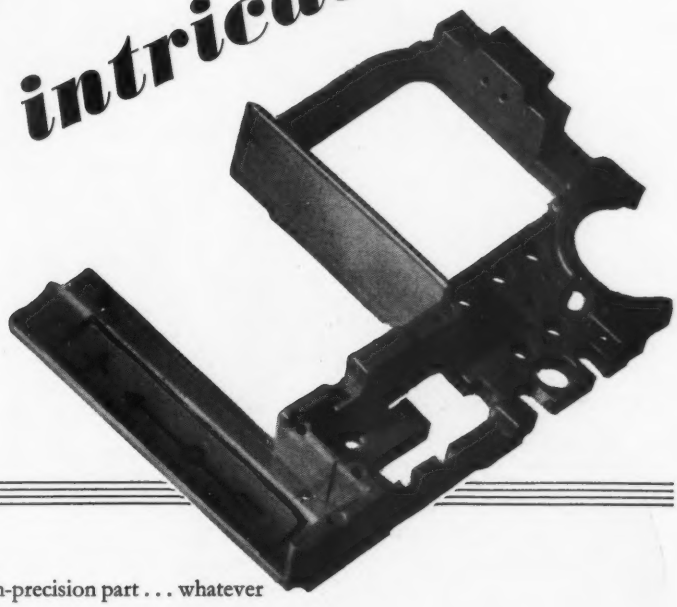
simple or intricate . . .



Simple coil winding bobbin or intricate high-precision part . . . whatever the job, we have the skill, experience and equipment to mould it accurately—in the most suitable plastic material. Our modern moulding shops are now among the largest in Europe. We can turn out injection mouldings of every description from the smallest to the largest. By replacing fabricated parts our mouldings have reduced manufacturing costs in scores of industries. It's more than likely we could save you money too! If you've a problem where a plastic moulding might help—*consult us.*

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Phenol Formaldehyde,
Urea Formaldehyde

THERMOPLASTIC
Cellulose Acetate, Cellulose Acetate Butyrate, Polymethylmethacrylate, Polystyrene including heat resisting and high impact grades, Nylon. **Flexible plastics:** Polyethylene, Polyvinylchloride

and here are a few of the processes we use . . .

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THERMOPLASTIC BLOW MOULDING
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and
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the plastics people

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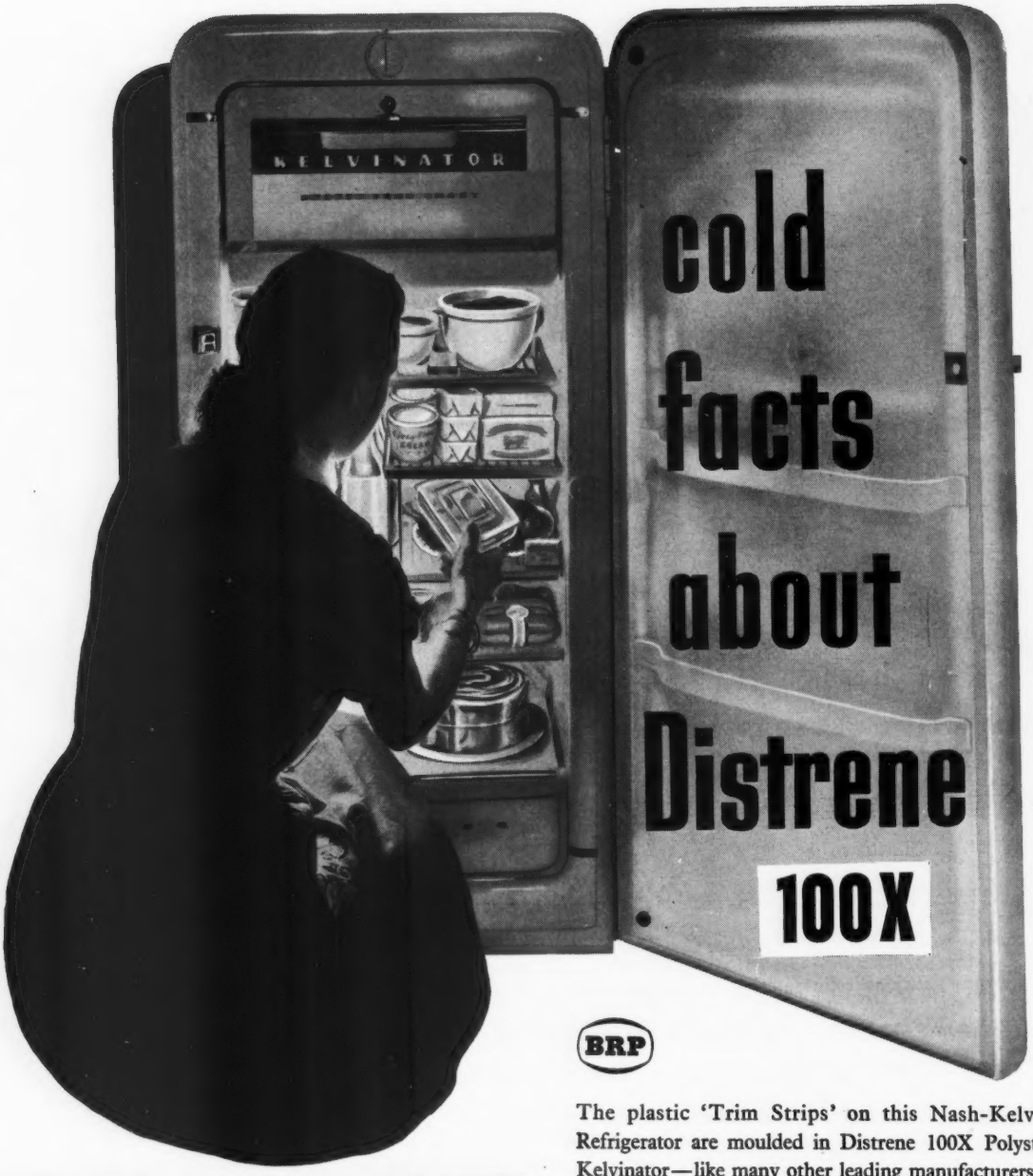

BRP

The plastic 'Trim Strips' on this Nash-Kelvinator Refrigerator are moulded in Distrene 100X Polystyrene. Kelvinator—like many other leading manufacturers—rely on Distrene because of its outstanding flow properties . . . extra-toughness . . . brilliant finish . . . permanence of colour . . . high dimensional stability and its ability to reproduce the most intricate design with the maximum economy. In addition, Distrene 100X gives a high gloss surface finish and is resistant to water and most dilute acids.

Trim Strips, Light Switch Escutcheon, Frost Indicator moulded on a 16 oz machine by Plastics Division of Universal Metal Products Ltd.

Ask to be put on our Mailing List (G) for regular information about BRP Moulding Materials.

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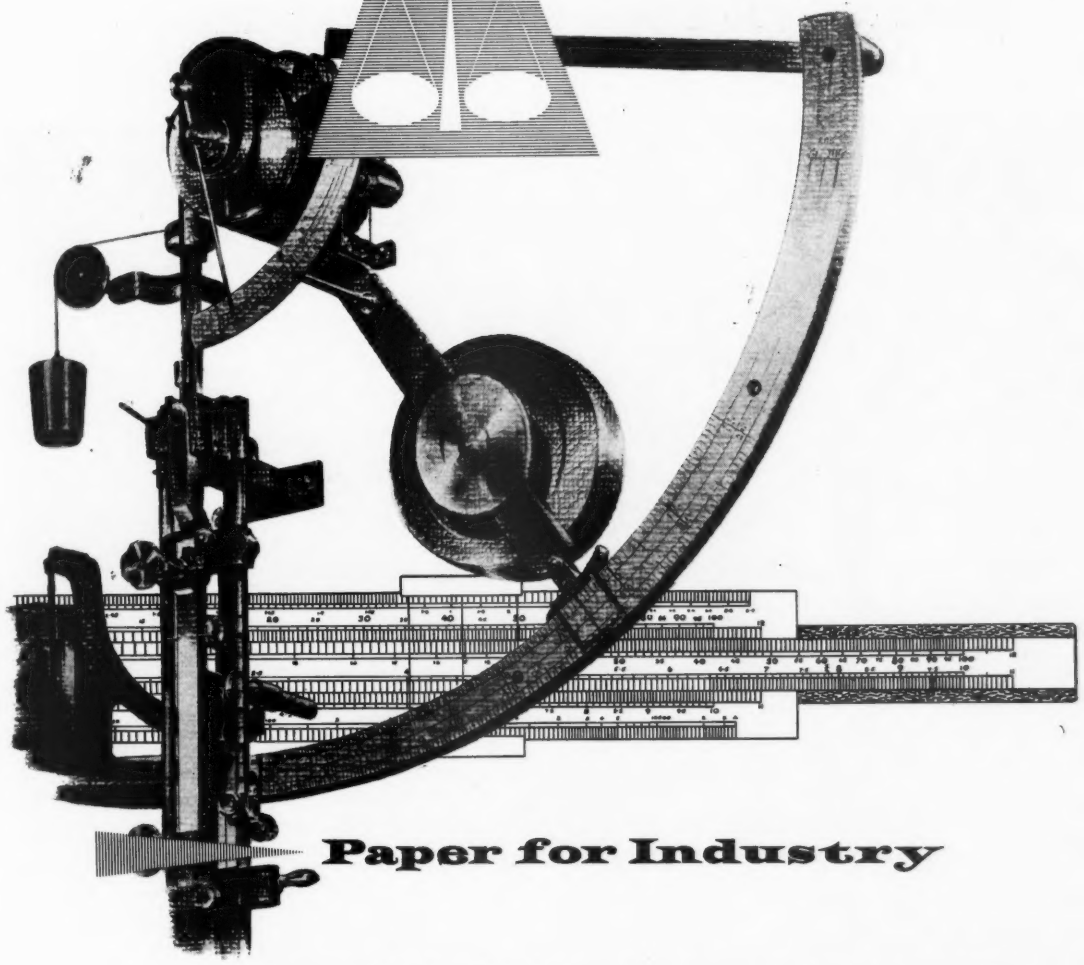

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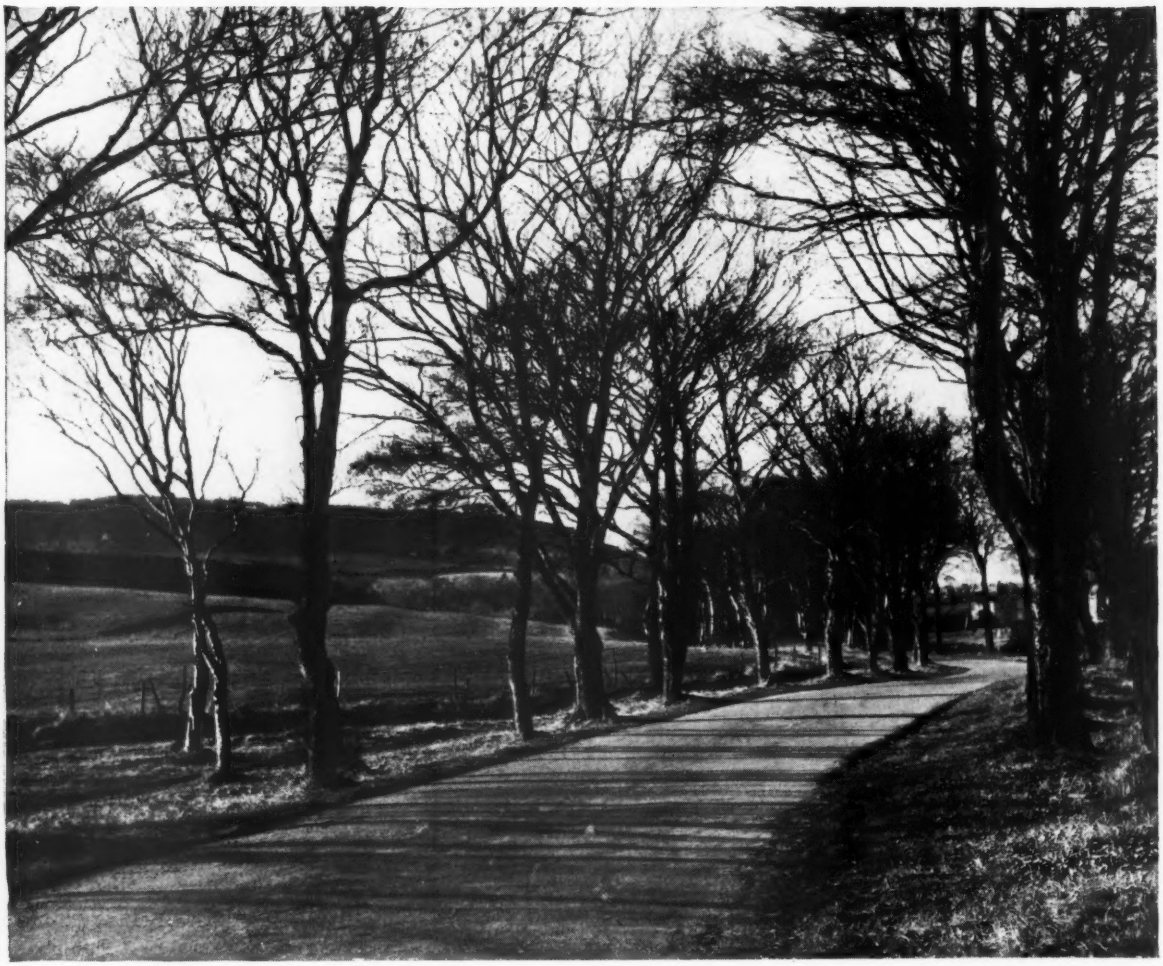

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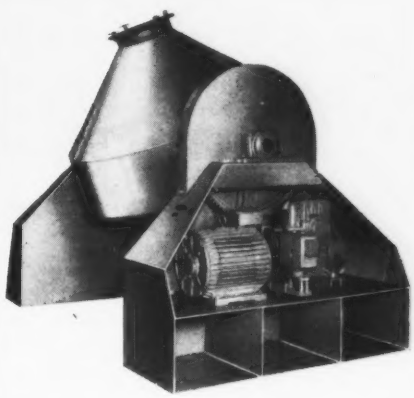

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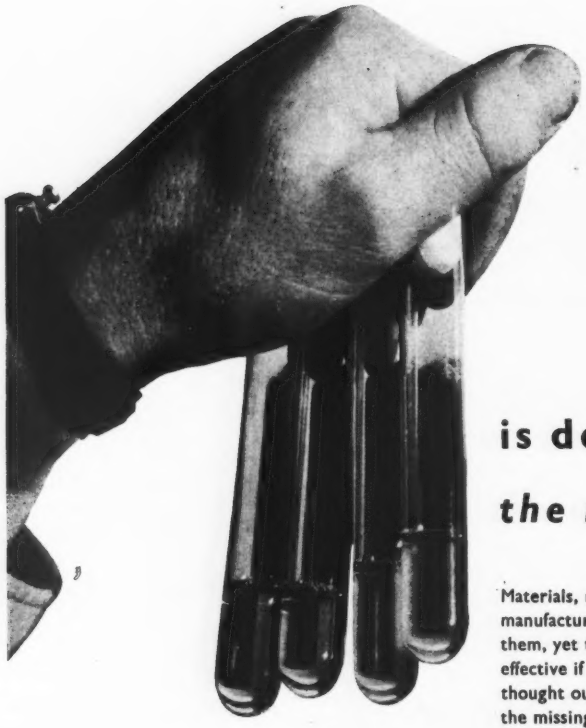

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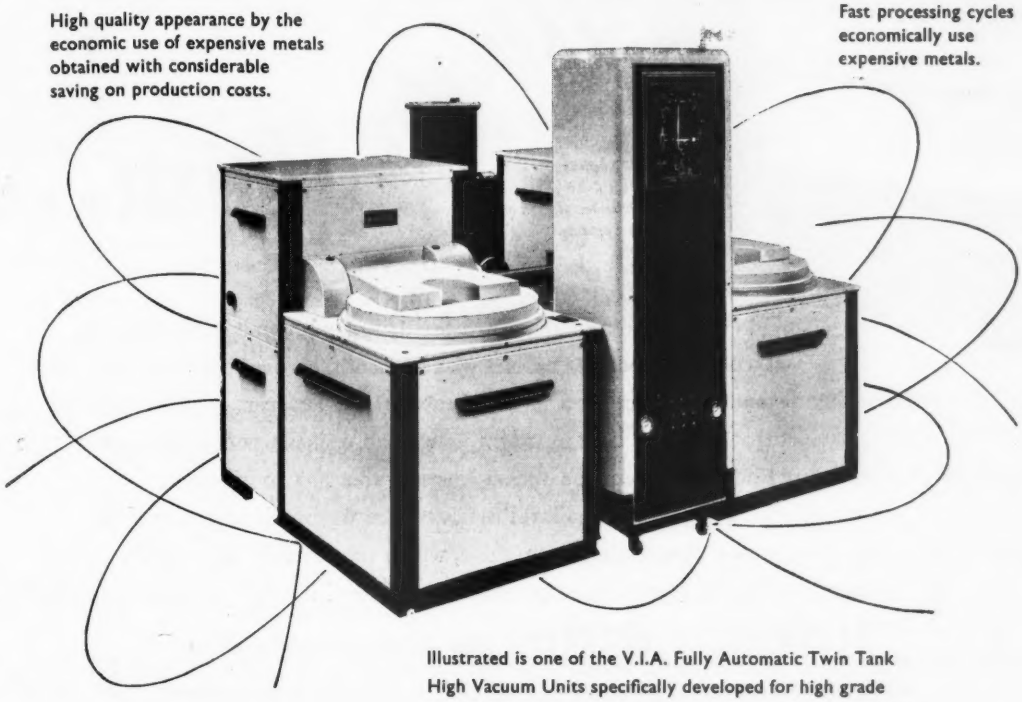

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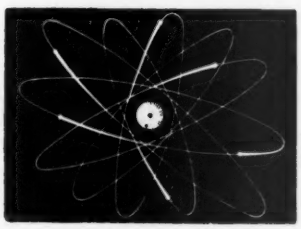

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EKCO plastics for industry

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We've had an unexpected visit from the two-headed Janus, fresh from closing the door on 1954 and opening it to 1955.

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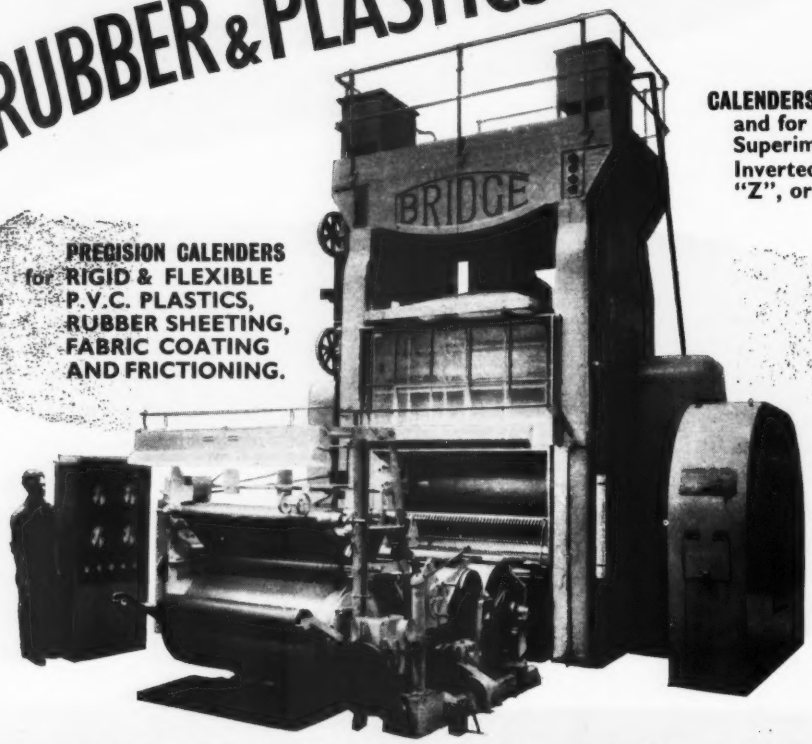

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The progress of colour

Colour at its most sublime . . .
colour in the hands of the artist

2 OIL

Among the first artists to realise the limitations of tempera was Jan van Eyck. He wanted to depict the roundness of forms, deep shadows and soft graduations of shading. So he evolved a completely new technique of painting with oil. We do not know exactly what Van Eyck used, but it is most likely that the pigment was ground in a specially refined oil, diluted with a volatile vehicle like our essence of turpentine.

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Colour means much in the life of man, and plastics, with their widespread uses, are helping more and more to brighten the everyday articles we use.

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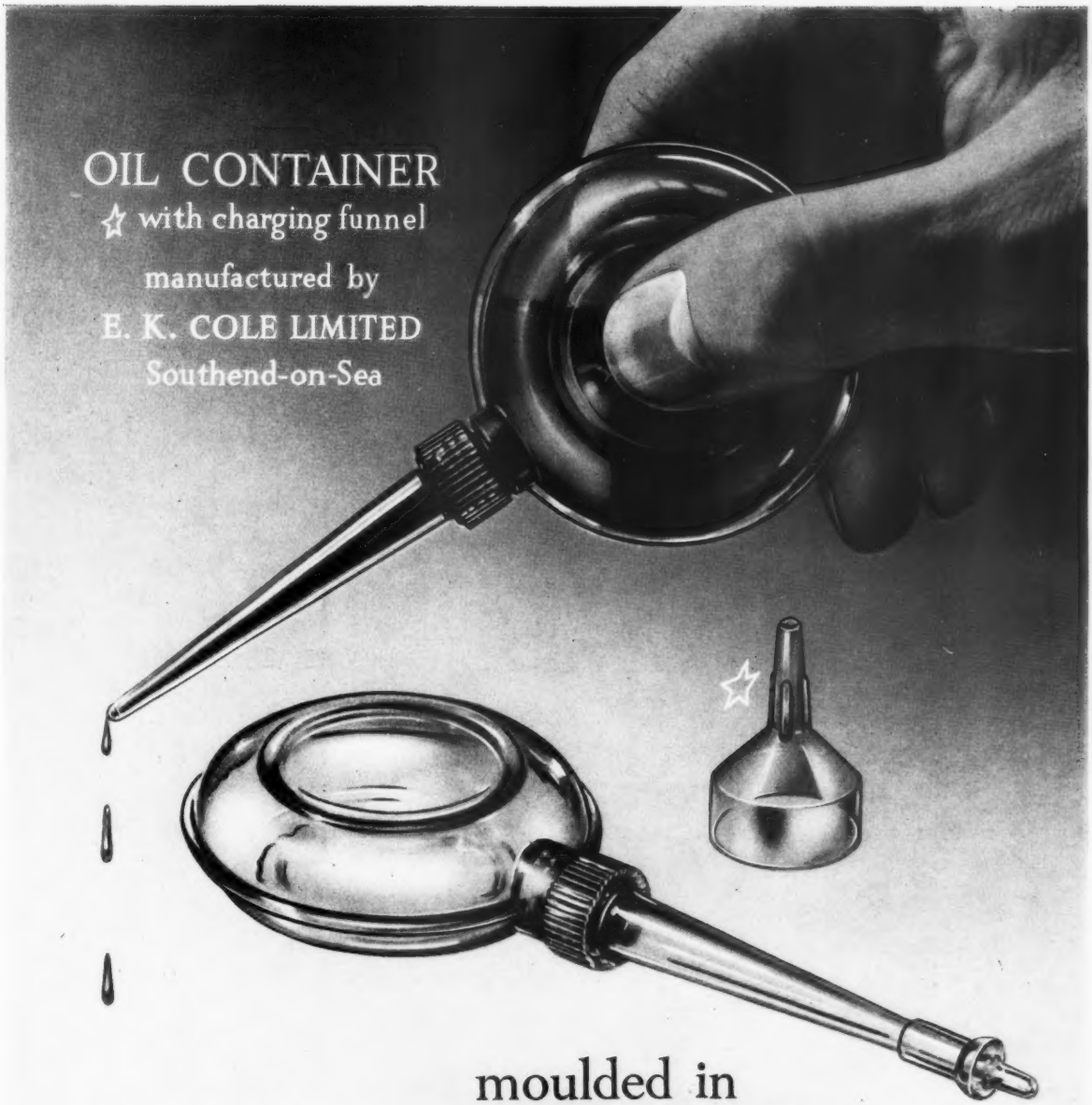

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ERINOID LIMITED · STROUD · GLOUCESTERSHIRE

PHENOL

A high-quality synthetic product meeting the most stringent requirements of the plastics industry.

XYLENOLS

A grade of refined cresylic acid of distillation range approximately 215-230°C. Total tar acid content 99.5 to 100%.

Availability:

Ample supplies for prompt delivery in road tank-wagons and in 40/45 gallon drums.

For further information, consult:

IMPERIAL CHEMICAL INDUSTRIES LTD., LONDON, S.W.1

B.244

Write for particulars, Sole Agents

Plant Installations Ltd.

Welton Manor, Welton, Nr. Daventry, Northants. • *Tel.: Daventry 257*

FOR TECHNICAL ADVICE AND DEMONSTRATION PHONE THE WORKS AT WORDSWORTH 4433

D

for Moulded Plastics Ask Crystalate to quote

COMPRESSION TRANSFER & INJECTION MOULDINGS INC. NYLON

CRYSTALATE LTD.
ASSOCIATING
MICA PRODUCTS LTD.

ALSO—
S R B P TUBES
BOBBINS
&
FORMERS

CRYSTALATE HOUSE, TONBRIDGE, KENT. PHONES TONBRIDGE 2261/5 (25 LINES)

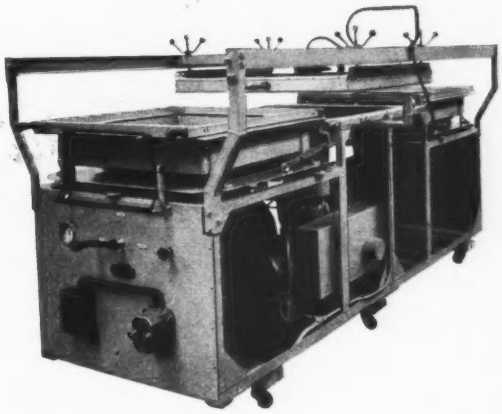
54 years of service to British Industries

Introducing the ***NEW.....***

PULSOMETER

VACUUM FORMING MACHINE

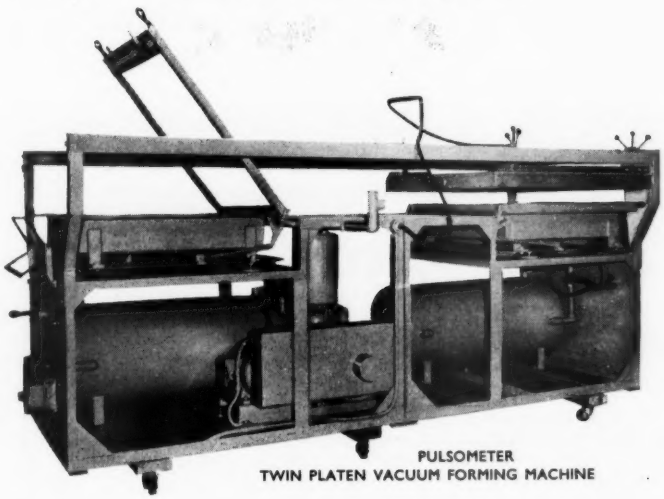
for THERMOPLASTIC SHEETS



Vacuum forming of plastic sheet enables a wide variety of articles to be manufactured which have previously been too expensive to mould by orthodox methods.

A particular application of vacuum forming is for the production of large area, deep drawn articles for the motor, aircraft, lighting and refrigeration industries, and also advertising and display purposes. Moulds can be made from cement, plastic, wood, cast-resins or light alloys.

Messrs. Pulsometer Engineering Company Limited, who manufacture this machine, have appointed us *Sole Agents in Great Britain.*



PULSOMETER
TWIN PLATEN VACUUM FORMING MACHINE

THE FOLLOWING MACHINES CAN BE SUPPLIED :—

A TWIN MACHINE (SUPPLIED AS STANDARD) FOR PLASTIC SHEET OF 36"x36" SIZE, CHAMBERS OF VARYING SIZES CAN BE FITTED IF DESIRED.

A SINGLE MACHINE SUITABLE FOR PLASTIC SHEET 26"x26" SIZE.

FURTHER DETAILS WILL BE SENT ON REQUEST

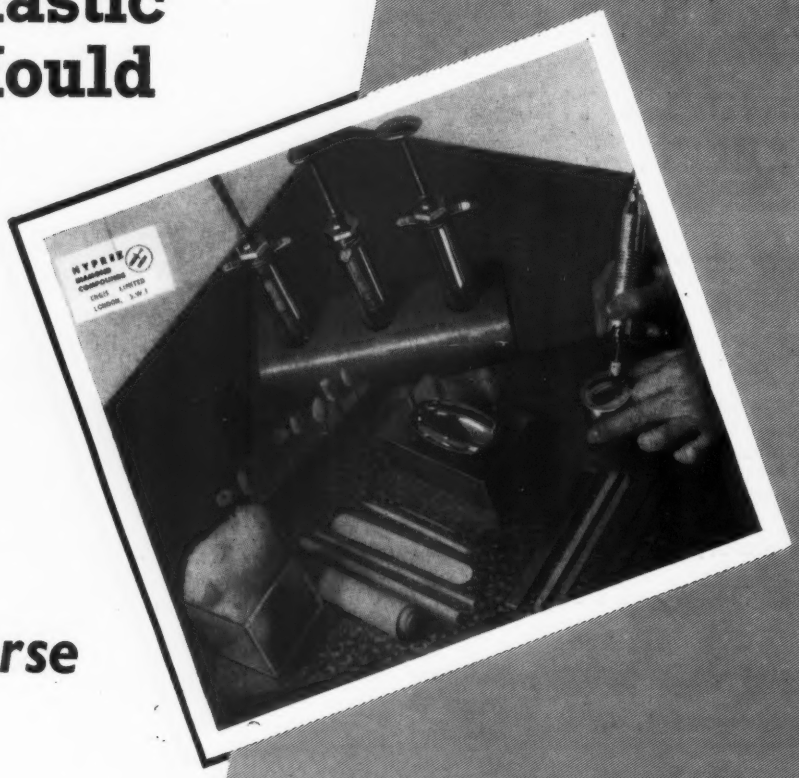
EARLY DELIVERY

SOLE AGENTS :—

ALFRED HERBERT LTD · COVENTRY

FACTORED DIVISION · RED LANE WORKS · *'PHONE 89221*

The Longest Lasting Plastic Mould is



— of course

HYPREZ finished

For ALL types of Plastic mould Hyprez Diamond Compound is fast, economical and accurate. There's no waste, no mixing! Surface imperfections, scratches and other defects are rapidly removed — and with the variation of grades and polishing accessories available, mirror finish is achieved in a moment— mould perfection is a matter of course.

Send for full details of compound grades and ALL lapping accessories to :—

ENGIS LTD. (HYPREZ DIVISION) 25, Victoria Street, Westminster, S.W.1.

Te'ephone: ABBEY 2487. Telegrams: Engis, Sowest, London. Cables: Engis, London.

Having a hand in Productivity

IN EVERY INDUSTRY OR TRADE, electrical equipment is the key to modern production methods. There are probably more production-boosting and money-saving devices than you know of. Your Electricity Board can help you and give you sound advice.

They can also make available to you, on free loan, several films on the uses of electricity in Industry — produced by the Electrical Development Association.

E.D.A. are publishing a series of books on "Electricity and Productivity". Four titles are available at the moment; they deal with Higher Production, Lighting, Materials Handling, and Resistance Heating. The books are 8/6 each (9/- post free) and the Electricity Boards (or E.D.A. themselves) can supply you.

The British Electrical Development Association
2 Savoy Hill, London, W.C.2.

Don't drill a hole

What do you do when you have to measure the plate thickness of a pressure vessel? Drill a hole and hope it is representative? Or do you use modern methods? The man in the picture is using one modern method: he is measuring the plate thickness of a pressure storage tank from one side only. No stunt, this; it is used a lot. It works by ultrasonics. The instrument is portable, as you can see, so there is no difficulty in climbing structures with it. What you cannot see is that the thickness is given by a direct reading on one dial, quickly. Anything from 1/16 in. to 12 in. in steel. This is

only one of the aids to higher productivity that Electricity can bring you.

Electricity
a Power of Good for PRODUCTIVITY

REOPLEX

Geigy

polyester plasticisers for P.V.C.

Low migration.

Resistance to oils, fats, petrol, solvents.

REOPLEX 100 and 110	High viscosity plasticisers offering maximum resistance to extraction and migration.
REOPLEX 200, 220 and 300	Low viscosity polyesters offering good low temperature performance, easy processing by calendering or paste spreading methods, improved resistance to extraction and migration over standard P.V.C. plasticisers.

USES

Protective clothing for chemical, milk, cheese, butter, fish industries, etc. where resistance to oils, fats and solvents is required.

Parts of P.V.C. clothing which are in contact with skin.

Packaging for oils and fats including foodstuffs.

Foodstuff conveyor belting.

Where non-migration or non-marring properties are required, *e.g.* radio frequency cable sheathing, bookcloth and similar coverings.

THE GEIGY COMP[illegible]TD.
RHODES, MIDDLET[illegible]MANCHESTER

P.32

Spanner in the works

. . . or the case of the contaminated powder

No need to look far for the culprit if you find "foreign bodies" in your mouldings. The answer is almost always in the material, that is if you are using inferior materials. Grist reprocessed material is produced from first quality scrap, carefully segregated, washed, cleaned and dried, tested magnetically for ferrous materials and Cintel tested for non-ferrous contamination, replasticised, and pigmented, and then extruded through fine screens and cubed.

It will pay you to see Grist Plastics about reprocessed Cellulose Acetate, Polystyrene and Polyethylene.

167 VICTORIA ST., LONDON, S.W.1 *Phone:* VICtoria 1414.

GRIST PLASTICS

ONE OF THE DOHM GROUP OF COMPANIES

HOT ON THE TRAIL

Are you harbouring scrap P.V.C., Cellulose Acetate, Polyethylene, Polystyrene or "Perspex"? We welcome all clues that lead us to these, or any kind of thermoplastic scrap and surplus material. Let us know the kinds and quantities you have to offer.

PLASTIC SCRAP **BERNARD CHASE**

DUNSTER HOUSE, MARK LANE, LONDON, E.C.3

Telephone : MINcing Lane 8551/6 *'Grams : Mulbright, London*

Agents for: **H. MUEHLSTEIN & CO., INC., 60, East 42nd Street, New York 17, N.Y.**

SALES PROMOTION!

SPECIALISTS
in the
DESIGN
DEVELOPMENT
and
PRODUCTION
of
ORIGINAL
NOVELTY ITEMS
for
SALES PROMOTION
RADIO
SPONSORED
TELEVISION

★ By kind permission we illustrate the plastic Space Cup designed and manufactured to the requirements of Horlicks Limited for their Radio Luxembourg Programme.

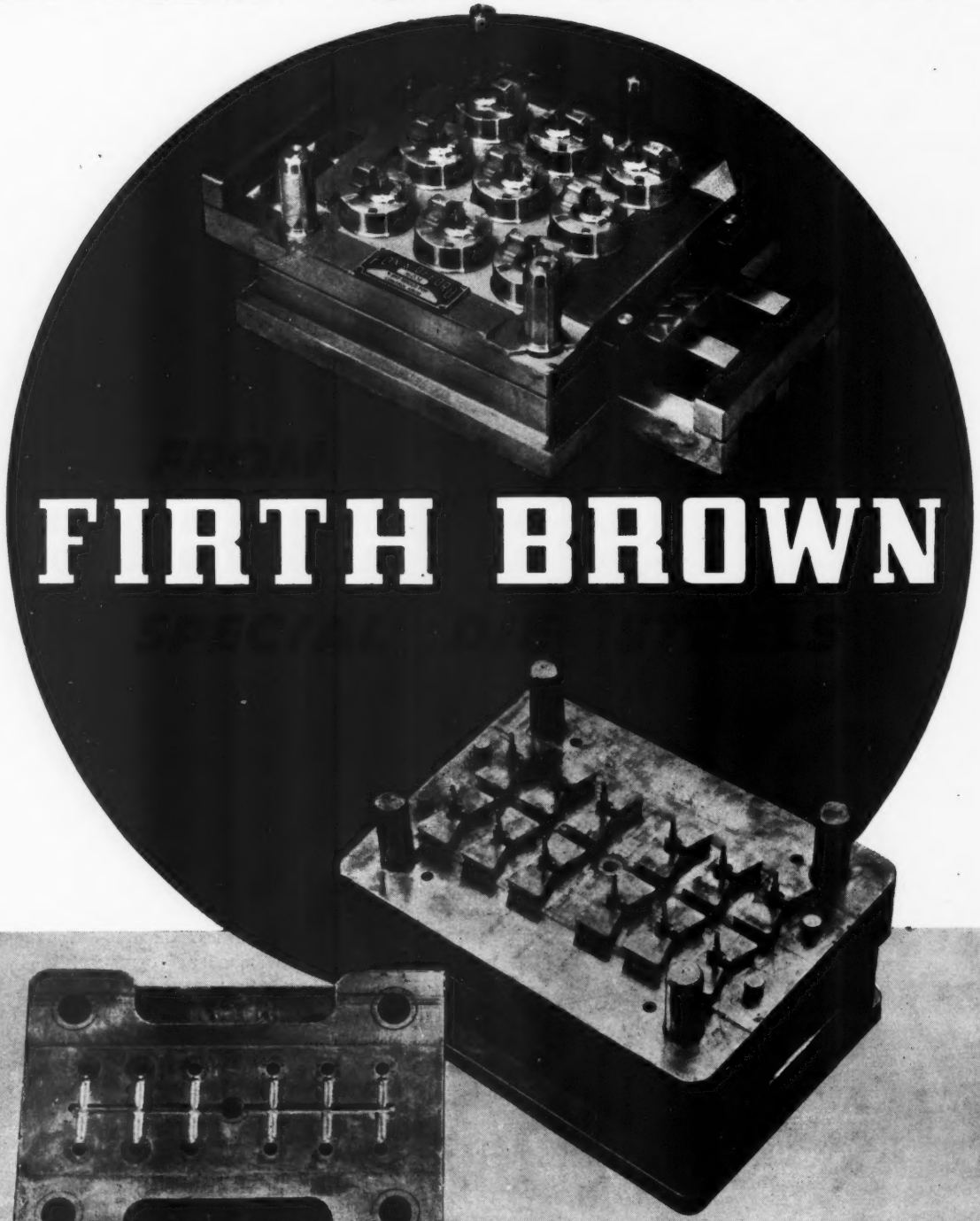
E·V·B PLASTICS LIMITED
SALFORDS · SURREY · ENGLAND

Specialists in long runs at lowest prices
All enquiries welcomed

Telephone : HO[illegible]

E

DIES FOR PLASTICS



FIRTH BROWN

Top photograph : Die by Messrs. Fox & Offord Ltd. for Messrs. Dorcam Ltd.
Bottom photographs by courtesy of The Metal Products (Treforest) Ltd.

THOS. FIRTH & JOHN BROWN, LIMITED, SHEFFIELD

You
cannot
do
better

than the best. The best in urea and melamine moulding powders is "Beetle". B.I.P. not only sets the highest standard of quality, but provides the maximum facilities in product styling and mould design. Utilise the full resources of B.I.P.'s outstanding technical services and . . .

MOULD IN

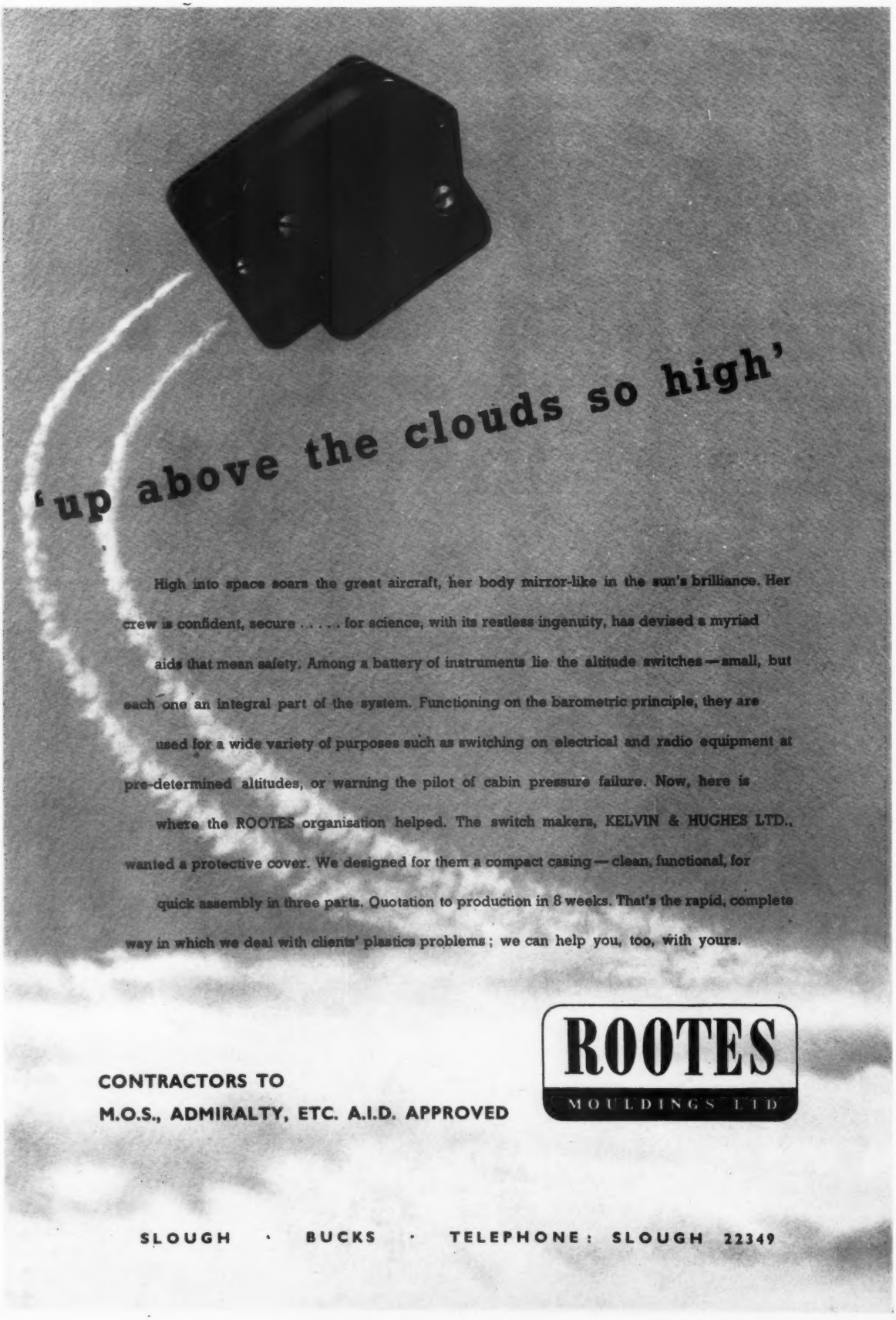
Beetle

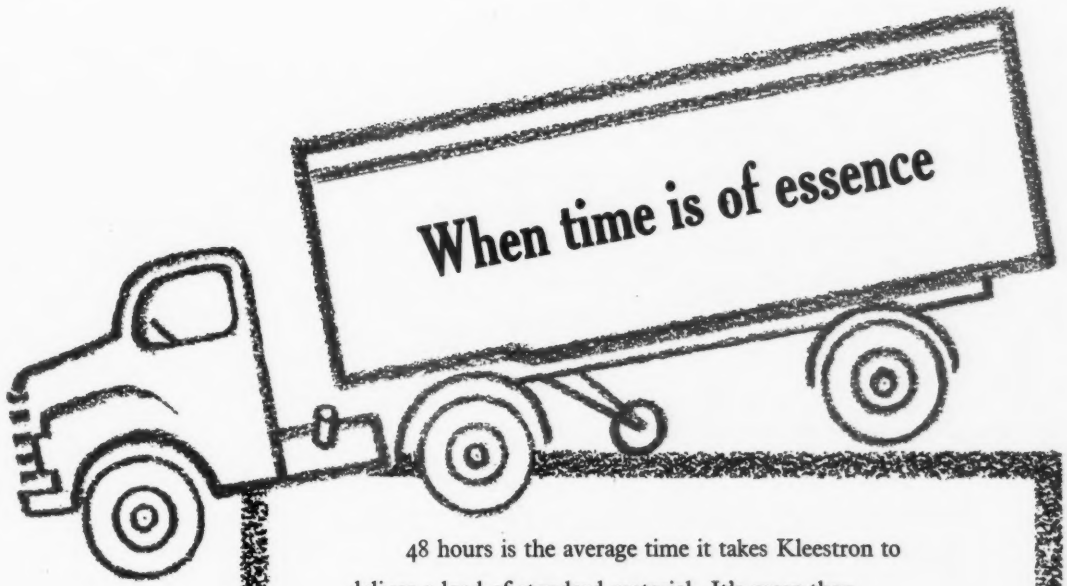
UREA AND MELAMINE MOULDING POWDERS

B·I·P GROUP

Full information and technical literature on request

BRITISH INDUSTRIAL PLASTICS LTD., 1 ARGYLL ST., LONDON, W.1. Tel: GERRARD 7811


'up above the clouds so high'
High into space soars the great aircraft, her body mirror-like in the sun's brilliance. Her crew is confident, secure . . . . . for science, with its restless ingenuity, has devised a myriad aids that mean safety. Among a battery of instruments lie the altitude switches — small, but each one an integral part of the system. Functioning on the barometric principle, they are used for a wide variety of purposes such as switching on electrical and radio equipment at pre-determined altitudes, or warning the pilot of cabin pressure failure. Now, here is where the ROOTES organisation helped. The switch makers, KELVIN & HUGHES LTD., wanted a protective cover. We designed for them a compact casing — clean, functional, for quick assembly in three parts. Quotation to production in 8 weeks. That's the rapid, complete way in which we deal with clients' plastics problems; we can help you, too, with yours.
CONTRACTORS TO
M.O.S., ADMIRALTY, ETC. A.I.D. APPROVED
ROOTES
MOULDINGS LTD
SLOUGH · BUCKS · TELEPHONE: SLOUGH 22349



48 hours is the average time it takes Kleestron to deliver a load of standard material. It's more than likely, that even as you read this, our trucks are loading up and on their way with anything from 200 lb. to 20,000 lb. of Kleestron polystyrene for delivery throughout the country. Customers everywhere have been impressed by the Kleestron service, particularly the rapid way in which we despatch special colour matchings.

Kleestron

—versatile plastics by versatile people

KLEESTRON LIMITED · West Halkin House · West Halkin Street · London · S.W.1. 'Phone: SLOane 0866

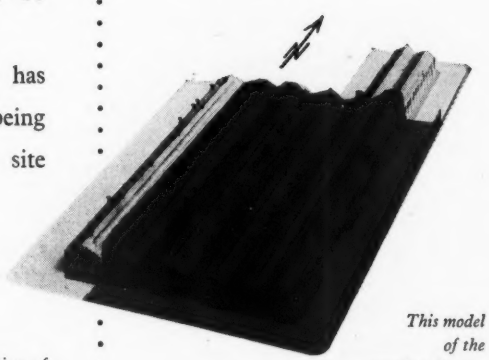
A GUARANTEE has been given by Beecham Buildings Ltd. to complete a new factory of 200,000 sq. ft. and considerable intricate ancillary work for an Industrial Organisation in the Midlands — within a year. This is the third advertisement telling the story.

Progress despite gales and floods!

Their *new ways of building* have enabled Beecham Buildings to make almost unimpeded progress during the recent appallingly bad weather. The structural frame of the main shop illustrated above, is now under way and rising rapidly; in the background to the right may be seen the North extension which is now complete.

The daily production of reinforced concrete components has been kept up and many of these weighing 6 or 7 tons are being transported from the factory of Beecham Buildings to the site where expert erectors and builders complete the job.

Further advertisements will continue to tell the story of this contract and to prove the value of our guarantee.



This model of the complete factory will pin-point progress in the advertisements which follow. Progress to date includes 120,000 cubic yards of excavation; perimeter roads, North extension, 75% of the foundations and 40% of the floors are complete.

Beecham Buildings

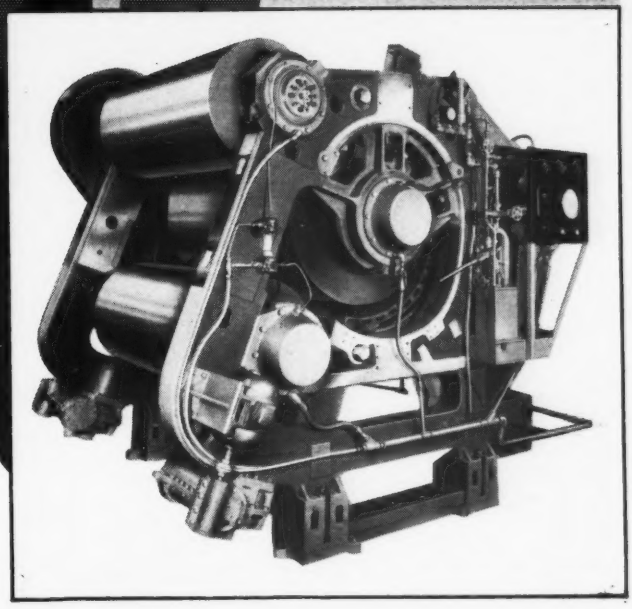
May we advise you on the construction of permanent and competitive Industrial Buildings?

BEECHAM BUILDINGS LTD
DEPT. K

SHIPSTON-ON-STOUR, WARWICKSHIRE
Telephone: Shipston-on-Stour 315, 316 & 3287

AP 211/43

Continuous vulcanization of rubber and the bonding of plastics for the production of belting, flooring, matting, and similar flat products.



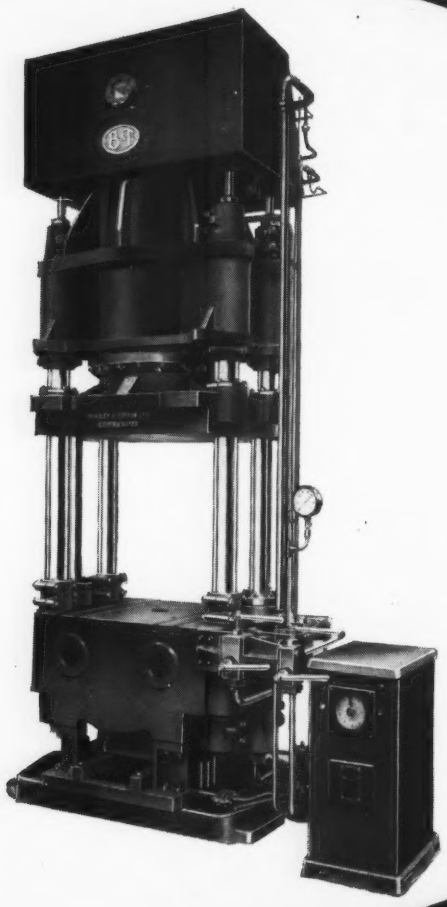
SHAW ROTOCURE machine

FRANCIS SHAW & CO. LTD., MANCHESTER 11, ENGLAND PHONE: EAST 1415/8 GRAMS: CALENDER MANCHESTER
LONDON OFFICE: 34 VICTORIA STREET, LONDON, S.W.1 PHONE: ABBEY 5077/8 GRAMS: VIBRATE, PHONE, LONDON

P.819

HYDRAULIC PRESSES

WITH AUTOMATIC CONTROL



No. 984-350 ton self-contained Press with Automatic Control Unit.

B&T

FOR COMPRESSION MOULDING
IN SIZES UP TO 1,000 TONS CAPACITY

This range of self-contained presses has been developed to meet the needs of manufacturers who want a press with its own pump unit and only requiring the electrical connection to be made for operation.
The motor-driven pump unit is mounted integrally on top of the press. Electric or gas fired ovens.
The working pressure is easily adjustable to provide a choice of varied moulding pressures.

Can be controlled manually or by Automatic Control Unit (as illustrated).
Automatic control enables any combination of movements including breathing and cure period to be repeated exactly on each cycle.
Independently controlled bottom ejector gear is incorporated with provision for semi-automatic top ejection.
Electric, Steam, or Gas-heated platens can be fitted.

Accumulator Control Cylinder Assembly · Hydraulic Valves · Automatic Moulding Cycle Control Units

Bradley & Turton Ltd

CALDWALL WORKS KIDDERMINSTER
TELEGRAMS: "WHEELS" KIDDERMINSTER TELEPHONE: 2217/8
Birmingham Office:
13 SOHO ROAD, HANDSWORTH, BIRMINGHAM, 20 TELEPHONE: NORTHERN 2519

THE LEADING MANUFACTURERS OF COMPRESSION MOULDING EQUIPMENT

This little girl can draw, write and spill paint on this new table-top. A quick wipe will make it clean—and it will then be used for dining.

Photographs by courtesy of Thomas De La Rue Ltd.

Double role for table-tops at

NEW SCHOOL

At the new Kidbrooke School in Greenwich—the L.C.C.'s first Comprehensive School—new table-tops perform a double function. They are used not only for lessons but for dining too.

This double role is possible because a famous laminate that is based on Melamine resins was chosen. Easy to clean and hygienic, the surface has a glossy, scratch-resistant finish that is far superior to any previously used.

Not only in schools—*wherever* they are used, laminates based on Melamine resins are the best available today.

B.O.C. make only the *chemical* Melamine. Names and addresses of manufacturers of Melamine resins and moulding powders will be supplied with pleasure. Please write for further information to:

Chemicals Division, British Oxygen Company Limited, Vigo Lane, Chester-le-Street, Co. Durham. ***Tel: Birtley 145.*** **London Office: Bridgewater House, Cleveland Row, St. James's, London, S.W.1.** ***Tel: Whitehall 9777.***

F

Hornflowa

U. F. POWDERS

★

PRESSRITE

The "General Purpose" MOULDING POWDER

Paper-filled, giving excellent physical properties, translucent, fine or densified. Available in 3 grades of flow: fast, medium and stiff. All colours.

FLOWRITE

Specially prepared for fine Quality Mouldings

High translucency imparted by special cellulose filler, undensified, any colour matched to order, ideal for buttons, custom jewellery, etc.

HORNFLOWA RESINS

Adhesives (close-contact and gap-filling types) surface coatings, textile impregnation (anti-shrinkage).

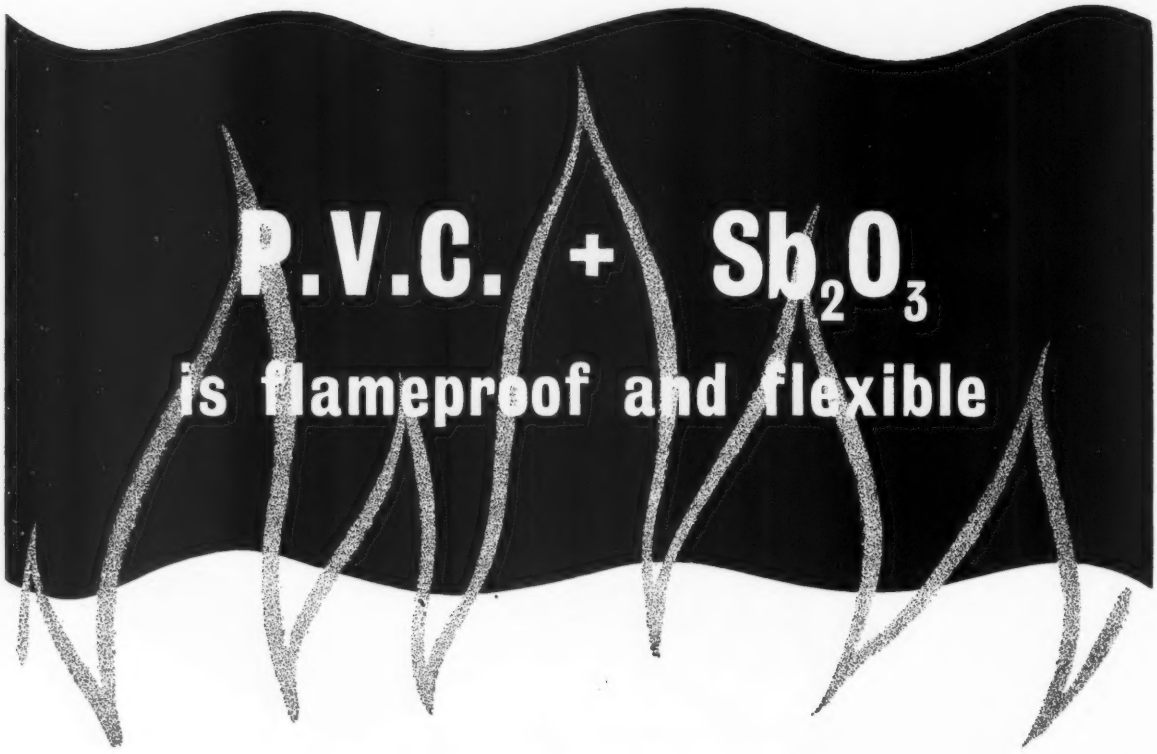
We are also makers of
JIGS and FIXTURES
GAUGES, MOULDS and DIES

Hornflowa LIMITED

MARYPORT · CUMBERLAND

PHONE: Maryport 251-2. GRAMS: Hornflowa, Maryport.

A. BOAKE, ROBERTS & COMPANY LTD. LONDON E.15. Tel: MARyland 5511



Experiments carried out by British Geon Limited * have shown that vinyl plastics can be made fire resistant without loss of flexibility by the addition of antimony trioxide. The trioxide successfully used in these experiments was the particularly pure and finely divided form made by Associated Lead and known as ... **TIMONOX**

* *These experiments are fully described in Geon Technical Note G.T.N.9.*

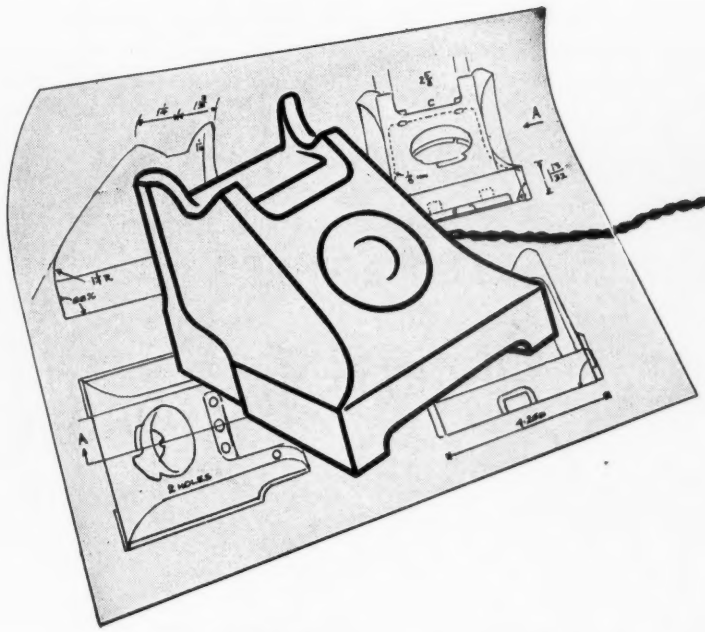
ASSOCIATED LEAD

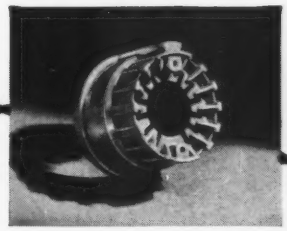
Associated Lead Manufacturers Limited is a single Company which specialises in the manufacture of lead and antimony products.

IBEX HOUSE, MINORIES, LONDON, E.C.3
CRESCENT HOUSE, NEWCASTLE
LEAD WORKS LANE, CHESTER

ASSOCIATED LEAD PRODUCTS

EXPORT ENQUIRIES TO: THE ASSOCIATED LEAD MANUFACTURERS EXPORT CO. LTD., IBEX HOUSE, MINORIES, LONDON, E.C.3

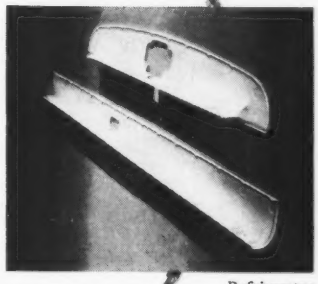




Cathode ray tube base in Nylon filled **PHENOLIC**

Washing machine agitator in **PHENOLIC**

Hair dryer casing in **UREA**



Refrigerator breaker strips in **POLYSTYRENE**

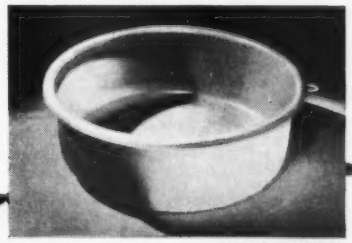
Line please?

Are there amongst your products one or two lines that could possibly be improved or made more cheaply in plastics?

There's a lot of first-class equipment, an enthusiastic team of designers and engineers—and no less than 40 years' experience in this business of plastics moulding, right at the end of your telephone line. The G.E.C. will get you through . . . the number is Temple Bar 8000.

G.E.C.

PLASTICS MOULDINGS IN ALL MATERIALS FOR EVERY INDUSTRY



Bowl in **POLYTHENE**

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2

MEN IN THE KNOW NO 4.

(Chemist)

. . . MIRACLES TO ORDER

Sometimes it does seem as though miracles are expected, but of course Scott Bader anticipated that, and developed their Technical Services for people like me.

***CRYSTIC & MARCO**

pioneer polyesters

FOR ALL GLASS FIBRE REINFORCED PLASTICS

SCOTT BADER & CO LTD, POLYESTER DIVISION

109 KINGSWAY LONDON WC2 Telephone HOLborn 3691 (3 lines)

Head Office & Works — Wollaston, Wellingborough, Northants.

* *A.I.D. and A.R.B. approved.*

"Let's call in the lively lads at Lorival!"

If it's something to do with plastics - leave it to the lively lads at Lorival.

They produce mouldings of high quality in large quantities at low prices.

Consider the following facts . . . then - call in Lorival's lively lads!

L56

Production—Lorival have one of the largest and most modern moulding shops in the country.

Tools—Mouldings can't be better than the tools that produce them. Lorival employ many of the finest designers and toolmakers in the business.

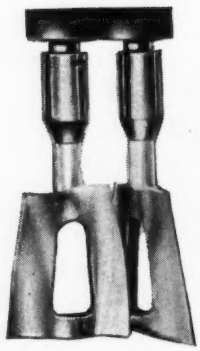
Speed—Lorival work literally day and night on a three-shifts production of more than 100 hours a week. Think what this means in terms of speedy delivery, output and low costs.

Co-operation—Lorival experts will discuss your problem either at your premises or theirs. If there's a way of saving you money—they'll find it!

LORIVAL PLASTICS

UNITED EBONITE AND LORIVAL LTD., LITTLE LEVER, NR. BOLTON, LANCS.

How can the TRUE MIX assist your production?



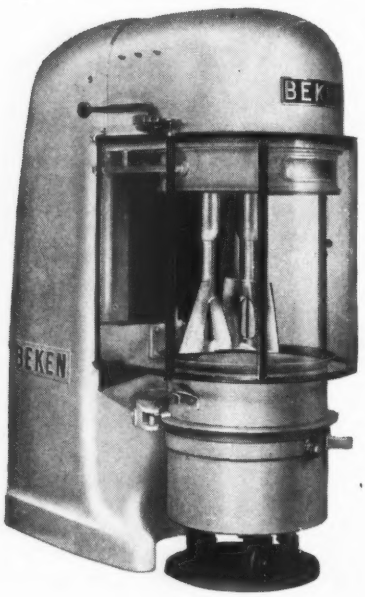
BEKEN Planetex Vertical Mixers have enabled many manufacturers to process their materials more economically than has hitherto been possible and with surprising improvements in the quality of the product. Among many examples are the following :—

SUBSTANTIAL REDUCTIONS IN PRODUCTION TIMES. Emulsion paint comprising pigment and emulsion completed in 20 minutes ; asbestos powder or short fibres mixed with cement in 10 minutes.

WHOLE PRODUCTION STAGES ELIMINATED. Pyrotechnical compounds hitherto milled after mixing now completely processed in mixer in one-third of the usual time, with a marked improvement in quality.

ACCEPTED LIMITATIONS REMOVED. Stiff doughs, light pastes and even powders are all mixed with an efficiency unequalled by existing mixers ; smooth creams and uniform pastes and doughs obtained free from lumps or balling ; performance consistently uniform.

FINAL PRODUCT IMPROVED. P.V.C. plasticised more rapidly and uniformly than hitherto possible in a mixer alone ; cotton fibre completely dispersed in cellulose acetate dope—searching tests of the mixer's efficiency and versatility !



These are examples of actual manufacturing problems which have been simplified by Beken Planetex Mixers. Generalisations are always inadvisable, but what is being performed for others may be possible with your own products. Why not permit us to carry out a mixing test with your materials, in confidence, and show what TRUE MIXING can save you.

THE BEKEN MIX is the TRUE mix

"PLANETEX" VERTICAL MIXERS
Sizes from 5 to 100 gallons
"DUPLEX" HORIZONTAL MIXERS
Sizes from 155 c.c. to 500 gallons

Sole Distributors :

LAVINO (LONDON) LIMITED

Kingsway House, London, W.C.2 PHONE : CHANCERY 6137

Sole Makers :

E. HUNT & CO. LIMITED

Ripple Road, Barking, Essex. PHONE : RIPPLEWAY 1444

If one green bottle...

should accidentally fall, or the whole ten, there would be no pieces to sweep up . . . because all Poly-Tainers are *unbreakable*. They carry creams, lotions, powders and chemicals in rigid or pliable Polythene . . . featherweight, airtight, acid resistant. We hold the world's largest range of stock moulds, all shapes, colours and sizes from ½ ounce to 15 gallons. Many world famous organisations use them. If you require a *special* Poly-Tainer we will make it for you. Our Design and Consultation Service is at *your* service. All "label" details can be embossed or printed direct by a new permanent process, in the colour you specify. That's **Poly-Tainer!**

Poly-Tainer

Featherweight unbreakable leakproof containers.

THERE'S NO SUBSTITUTE

for a genuine Poly-Tainer.
Look for the name on the bottom.

Distributed by: **INDUSTRIAL APPLIANCES LTD., 21/22J Grosvenor Street, London, W.1. Telephone: GROsvenor 5249, 5680 (P.B.X.).**

Manufactured by: **E. Shipton & Co. Ltd., Ferndown Works, Northwood Hills, Middx. Telephone: PINNER 1103/5 (P.B.X.).**

G

Asbestos-filled Phenolic Moulding Materials

Laminated Sheet Rod and Tube

Shell Moulding and Core Binding Resins

Polyester Resins

Wood-filled Phenolic

Cotton and Mineral-filled Phenolic Moulding Materials

Glass Fabric and Asbestos Based Laminates

Alkyd Moulding Materials

Impregnated Papers and Fabrics

Brake Lining Resins

Phenolic and Urea Adhesives

High Impact Polystyrene

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Plastics

DEALING WITH THE MANUFACTURE, USES AND POTENTIALITIES OF PLASTIC MATERIALS

PROPRIETORS: TEMPLE PRESS LIMITED

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CONTENTS

	Page
Editorials	35
Moulding Powder and Shot	36
Decoration of Melamine Mouldings	37
Production Story	39
"Terylene" Manufacture Begins at Wilton	42
Plastics in the Service of Man	44
World's Industry Employs Plastics	48
Letters to the Editor	49
Paris Plastics Exhibition	50
Industrial Applications of Nylon	52
Packaging Exhibition Review	55
Parkes and Pyroxylin, by M. Schofield, M.A., B.Sc., F.R.I.C.	58
New Productions	59
Plastics News	61
Talking Shop	64
Patent Review	65

EDITOR: M. D. CURWEN, B.Sc., A.R.I.C.
ASSISTANT EDITOR: C. W. WELCH.

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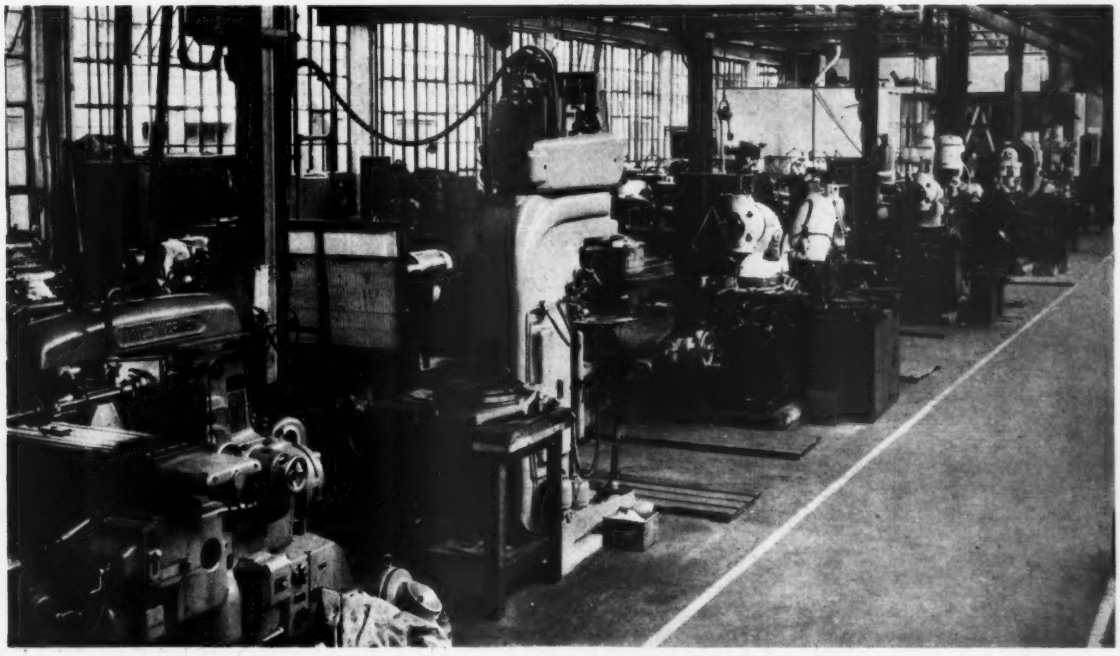

The tool-room at the Walthamstow, London, works of British Moulded Plastics Ltd.

NPI4

RAPID PRODUCTION by continuous process...

For example, a nozzle for a vacuum cleaner, required in large quantities, is extruded as a continuous tube from P.V.C. plastic, cut to length and the flat portion formed to shape. Plastics extrusions in five different materials, formed in sections to suit each particular need, are produced in very large quantities at our Walthamstow factory. It is well worth your while to examine with our technicians how components of this type may be of use to you.

NATIONAL PLASTICS (Sales) LTD

SALES ORGANISATION FOR BRITISH MOULDED PLASTICS LTD

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Plastics

VOL. XX. No. 211 FEBRUARY, 1955

EDITORIALS

New Lamps for Old

MORE than 30 years ago in the Americas we were observing the birth of a new chemical industry, derived purely from petroleum. It seemed, then, a very far cry from those still farther off days when kerosene, also called photogene lamp oil, was the most important of petroleum products, when modern gasoline or petrol was unknown because the internal combustion engine had not been born, and when "petroleum ether" and ligroin, light fractions from petroleum, constituted two of the few solvents for laboratory work. Both are almost unknown by these names today by the modern chemist.

By 1920 the mere "topping" plant making only petrol, kerosene and residual fuel oil was coming to an end; we were in the advanced days when the "complete" refinery producing petrol, kerosene, gas oil, light and heavy lubricating oils, paraffin wax and paraffin jelly, "medicinal paraffin" and asphalts was the most advanced stage of petroleum technology. By 1925 the first cracking plants were in operation splitting the kerosene "molecule" into two molecules and two volumes (or nearly) of petrol accompanied by much gas and coke. By 1930 the production of chemicals from unsaturated gases and liquids was a major industry, and this country saw the imports of isopropyl alcohol, isobutyl alcohol and esters made from them at low cost for use in the growing lacquer and other industries, almost wiping out in a very few years the conventional methods of production. Today the products of the new chemical industry are legion and rival those of coal tar distillation on which British chemical manufacture was built.

In January, we had the pleasure of visiting Wilton in the North Riding of Yorkshire where the huge new I.C.I. factory for making "Terylene" fibre is now in production. The two chief basic chemicals are made from petroleum-derived ethylene gas and para xylene. At the other end of the plant emerges from the spinnerets a shimmering fine, yet strong, filament to be spun on to bobbins for the textile factories of the world. It is the first completely man-made fibre of British invention to be made from petroleum products.

On Modifying Plastics

THE pronouncement (discussed last month) that there is probably a limit to the number of new types of plastics that can be produced and that modification of existing ones can do much to satisfy new requirements, becomes of exceptional importance in view of fast-changing conditions; indeed, in certain narrow fields at any rate, the need for better properties has never been more apparent. At the same time we must recognize the limitations of plastics, e.g., heat resistance, limitations which we are prone to forget.

As good an example as any of a material on which research work has been carried out almost continually since its appearance is polymethylmethacrylate, known in sheet form here as "Perspex," in the United States as "Lucite" and in Germany as "Plexiglas." It was hailed on its appearance in 1935 as a "miracle" material and almost deserved even this adjective, for with its superb transparency, its adequate strength and the ease of its shaping, it could, in certain circumscribed fields, replace the thousand-year-old inorganic glass, with defects that are so apparent. It quickly replaced cellulose acetate sheet, which had been used on the older type of aircraft, it has become important for glazing in factories and offices and for the making of certain new tools for the surgeon. It is superb for making transparent models for engineering research, for moulding cups and saucers and refrigerator food trays and covers and in the rapidly growing fields of advertising.

It was early seen that the material possessed certain "defects," disclosed either by proper technical analysis or by the public through misuse of the object bought; happily this has resulted in a recognition of its proper limitations and, indeed, in the present increased demand. These limitations comprise comparatively low heat resistance, low surface hardness and low resistance to scratching, properties which no doubt are closely related. They are, it must be made clear, relative terms only, for tens of thousands of aircraft have flown with such components at their present high speeds in perfect safety and a vast number of other units have proved eminently successful in long use.

The first move to increase hardness and resistance to higher temperatures was announced here shortly after the war, following the production of a chlorine derivative. Hardness and resistance to heat were improved considerably, but the difficulties entailing the manufacture of a chlor-acrylic compound were too great to warrant further exploitation and the process was discontinued. It has been reported that a United States company is re-examining the problem.

A more recent development is of direct interest to fabricators of tableware, advertising signs and many other products. The manufacturers, by means of greater control in polymerization or separation, have succeeded in producing a "purer" methyl methacrylate, resulting in similar advantages; one interesting effect is the claim by one fabricator that cups and saucers do not stain in use with tea and coffee. This must be due, we presume, to an increase in surface hardness. It would be important to know whether or not the surface is now sufficiently hard to re-interest motorcar manufacturers in its use as the front window glazing.

Progress so far is thus interesting and valuable, but there loom ahead demands that, so far as our knowledge goes, cannot yet be satisfied. We refer to the supply of transparent sheet for canopies, radomes, etc., for the aircraft of the future, aircraft that will travel at 1,500 m.p.h. and much more; the sheet must remain rigid at temperatures between 150° C. and 180° C. No known type can withstand such temperatures.

Nevertheless considerable work has been done on the obvious method of attaining such properties, namely the cross-linking of polymethylmethacrylate retaining at the same time its transparency. The results of more recent work on the subject here and in the U.S.A. have not been generally divulged, but no doubt we shall all know them in due course

Growth of a Factory

WE remember visiting the town of Gloucester several years before the outbreak of World War II to meet A. A. Heath, the director of a factory making "phenolic" impregnated laminates for the electrical and heavy industry. It was not the only factory doing this work, but it was one of the very few devoted solely to it. Moreover, it was even more specialized in that it was using wood, i.e., wood veneer only for the purpose. The wood then was acacia; beech is now employed. Even this early factory was laid out with conspicuous efficiency with its necessarily large airy bays for the reception of the light raw material, the impregnation tanks, the drying ovens, the machining tools, mechanical and electrical testing departments, and the serried rows of shelves with thousands of finished components. We remember remarking at this end to Mr. Heath: "At least you don't have to grease them to prevent rusting if they're here too long." He gave us one of his now familiar grins and drawled dryly: "We're going to try to sell a few."

Last month we were invited to see a film about his company, Permali, Ltd., called "From Strength to Strength," in which the state of the company in 1955 is described. There is now a large number of factories, some around Gloucester town, one up in the north and the well-known Hordern-Richmond company, familiar to us as aircraft propeller-blade manufacturers, has been absorbed, and there are also a number of associated companies in foreign countries. The film was excellent and carefully designed to convey to potential customers the superb electrical, chemical and mechanical strengths of the products made and the extraordinary precautions and tests taken to ensure that all specifications of outgoing units and components (some of them are of huge size) are complied with in all respects before they leave for the four corners of the earth. We saw great laminated wood structures for the new electrical schemes being erected, and the installing in steel-rolling mills of large laminated bearings that without traditional lubricant outlast by far the finest phosphor-bronze bearings. We saw gear wheels in use, components for Jacquard and other textile looms that undergo great and continual impacts without deterioration. The film told the story much better than any technical article can. But then the factories and the applications of the products are impressive as is the organization behind them.

MOULDING POWDER AND SHOT

Ça c'est Paris

In the Editor's remarkable notes on the Paris Plastics Exhibition, which I am sure will go down into French plastics history (the Exhibition I mean, not the notes), is an implication that he learned but little from the general layout of the show other than that the avenues were straight and named after famous European scientists. Very interesting no doubt, but he completely missed something of greater importance, that even the *British Plastics* people would have noted and perhaps copied in June next, if they had seen it which they did not—a great circular bar, slap in the middle of the central circus of the exhibition at the junction of Avenue Ampère and Avenue Chardonnet (this name should mean artificial silk to you). Perfect strategy! There I saw Harold Lusty and Percy Smith of Bakelite, Ltd., both completely exhausted after their round of the stands and their wearying work of the night before—reviving rapidly by an equally rapid consumption of hot dogs and a yellow-coloured effervescent elixir. It is for this basic understanding of the frightful rigours of modern life we owe so much to the French and of which *l'Anglais avec son sang-froid habituel* (translation: the Englishman with his usual ——— cold), has no comprehension at all. Let us therefore resolve, with all the strength that is in us, etc.!

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Dull Grammar Lesson

The "official" English dictionaries do not contain the word "plastics" either as noun or adjective. They contain only the adjective "plastic" used in expressions such as "plastic deformation" and, as a modern sop, "plastic art." Since, in English, the adjective never takes the plural to accord with a plural noun, we can say "plastic deformations" but never "plastics deformations." Something to do with dissonance or discord, I suppose. The French do use plural adjectives, but since the "s" is silent, retain euphony; thus "belles femmes" sounds just as beautiful as "belle femme." No Englishman worthy of the name would say "Oh, you beautifuls dolls!" But English is a flexible language and we permit the entry of new words with time. We have already done so with the noun "plastic" and its plural "plastics" without more than an occasional hoot of derision from the pedants. In 1951 the British Standards Institute, in its wisdom, introduced them into its glossary of terms used in our industry. But it also introduced the adjective "plastics" and laid down that to use the singular adjective "plastic" is incorrect. Now we are all obviously in a quandary. The nub of the trouble lies in the fact that some moulded objects are thermoplastic and are therefore truly plastic materials while thermoset mouldings are not. To dodge the issue, or, perhaps we should say, to bring order out of chaos, we are asked to use the new adjective "plastics" applied both to thermoplastic and thermoset mouldings. Equally, to use the adjective "plastic" to describe both cases would be dodging the issue. Either word would be theoretically permissible if we decided to cut free from the original meaning. Where do we go from here, when both suggestions start out on the wrong foot? Let us take the adjective "plastics" first. Here we have the unique case in the whole history of English philology, etymology, lexicography and grammar of an attempt to squeeze the subversive plural into the English language. There is not a single English adjective that has ever grown an "s" at the hints so often thrown out to it by its neighbouring noun—at least we cannot think of one. And there is reason enough as we have said. The final "s" brings discord; worse, the final "cs" in "plastics" brings cacaphony and a dangerous catching of the tongue in the upper palate of your set of plastics dentures. Heaven help the moulder who makes plastics swizzle-sticks! Just to tell you how serious the matter can be, I am at present doing a fine line in plastics samovars (made in glass-filled p.f.) and when saying it the other day over the telephone to my customers in Irkutsk I was accused of saying they were plastic samovars and very sharply informed that they would be rejected if made in polythene. On the whole, I'm all out for the American decision (Dr. Gordon Kline, of the American Society for Testing Materials, wrote to me about it in 1946, I believe) to disregard anomalies, to start afresh and cut across convention, to regard euphony as important and to plump for "plastic" as an adjective. Dissonance—discord, cannot last long in a language. It is sad to think that whatever the word chosen, the Editor of *Plastics* will continue his evil course peppering his sentences with "plastic" or "plastics" adjectives as carefully as ever did the enemy who sowed tares among the good wheat. To make confusion more confounded, here is an abstract from an advertisement in *Life* by the famous American Cyanamide Company: "Materials for the plastics industry—Melmac, one of several new plastic materials. . . ."

DOGSBODDY.

Decoration of Melamine Mouldings

Additional notes on recent developments in the application of art to melamine tableware

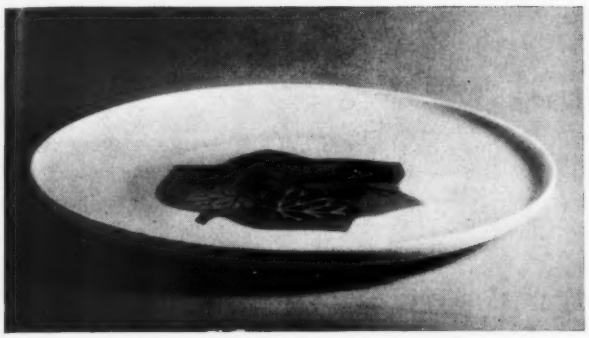


Fig. 1. (Left) Decorated melamine fruit dish by Runcolite Ltd.

OUR readers would have guessed by our previous references to this subject and our expressed hopes of its development with tableware that we have been "sold" the idea, just as easily in fact as it was to sell us the decorated phenolic laminate idea that was born about 20 years ago and has given us the lovely murals and table tops of today.

Expressed on moulded ware it has naturally been an even more difficult problem since exactly the same methods are not applicable. The type of decoration, in the form of a printed or otherwise decorated cellulose layer impregnated with melamine resin, cannot be incorporated into the surface once the basic moulded form has been completely cured. The decorated layer (or "transfer") has to be impressed on to the surface of a "half"-cured moulding subjected to a second compression to complete the cure, which implies the use of double moulding on one press or the use of a second press to maintain flows of production in the first. Whatever the difficulties and the slowing of production entailed we cannot express too strongly the hope that this new endeavour will continue and that its acceptance by the buying public will be realized. The only true art applied by the plastics industry, other than form, is that present on decorative laminates. Otherwise pictorial art permanently fixed on plastics is conspicuously absent.

The first successes that we noted in this country were produced about 1950 by Runcolite Ltd., who sent us a beautifully designed fruit dish, Fig. 1, with an exquisite flower design in the modern manner incorporated into the surface. To this day the blue and crimson of the flowers, and the delicate green, greys and yellows of the background are an unchanged joy to the eye. For the Coronation year this company we believe issued a series of such plates and trays with varied designs which were extremely popular and sold readily on the market.

The past year or so has seen an increase in the interest of this process in Switzerland, in France and again in this country. The examples shown in Figs. 2-6 were all carried out by the method already described, namely the production of a moulding in the half-cured condition, the laying on the surface of a melamine resin impregnated sheet with a printed design, followed by a final curing which incorporates the sheet permanently and inseparably into the moulding. The specimens were borrowed from the collection of Mr. T. G. Brooke-Hitching, of Ranton and Co., Ltd., to whom we offer our

Fig. 3. Decorated melamine plate (Ranton & Co., Ltd., Brentford, Middlesex).

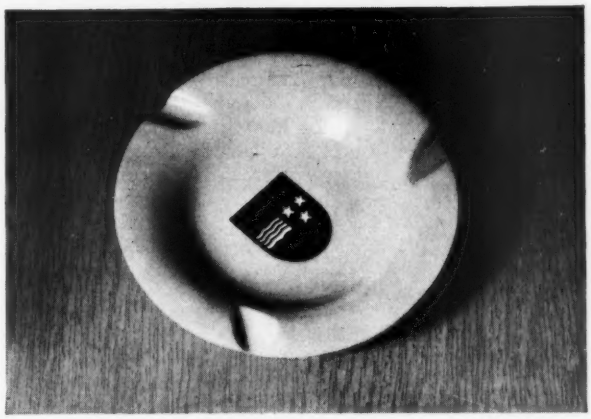
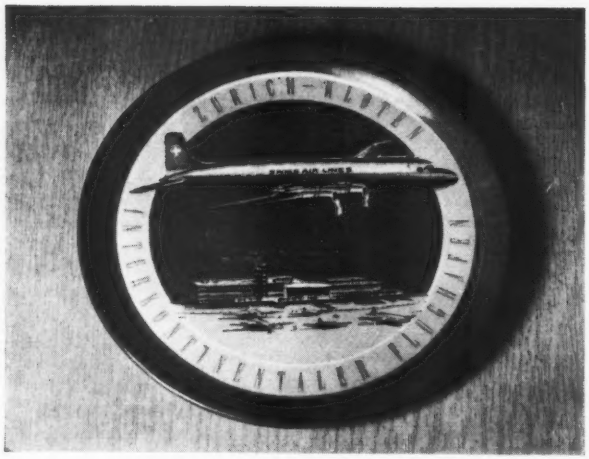
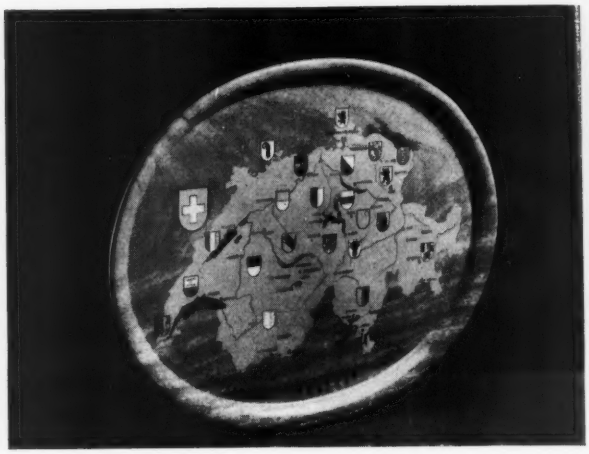


Fig. 2. Melamine ashtray in Oramin (Swiss) with "moulded in" insignia. Relatively simple impression of insignia.

Fig. 4. Melamine moulded cup and saucer with green rim decoration (Plastorex, Annecy, France). Probably the most difficult type of decoration.





Figs. 5 and 6. Two melamine trays in Oramin, (left) for Swiss air line and (right) "souvenir" tray.

thanks for the very kind co-operation and help which he extended to us in this experimental work.

From the very nature of the method and from a close examination of the work the difficulties involved can be readily imagined. Incorporation of a designed sheet on a flat surface may be considered easy. Incorporation on a curved surface obviously becomes more difficult in proportion to the radius of curvature and in proportion to the area of the imposed design, since slipping and wrinkling may occur when the two halves of the mould are brought together. The difficulties increase with double curvature while imposition on say the outside of a cup of an all-round design, even using a split mould would appear to be the most difficult of all.

Experiment Continued

Readers will remember our suggestion of a vaguely possible alternative to the above process, namely the painting by hand or otherwise or by application of a design by transfer on to the surface of a cup or saucer, and the spraying of a synthetic varnish thereon followed by a stoving process.

Two of the cups so painted and reproduced in our November, 1954, issue were taken to the works of Cellon, Ltd., Kingston, Surrey, who had offered to spray the outside of each and stove the specimens. Advantage of the simplicity of spraying was taken to test two different types of synthetic varnish at the same time on each cup.

Following stoving the highly glazed cups were then subjected to the simple test of putting them to normal use. They have to date been employed for tea and coffee drinking for two and a half months at a minimum of twice a day and sometimes three times a day. After each use the cups have been washed with very hot water varying between 160°-180° F.

None of the varnishes on the "vertical" surfaces of the cups (see Fig. 8) appears to have been affected. No visible cracks have been noted and none of the designs or lines appears to have suffered degradation. Moreover the glaze, which is much more pronounced than the original melamine surface, seems as bright as the original film. However, a faint "crazing" is noted on the horizontal flat portion of one of the cups (left in photograph) and there is similar crazing around the "joints" in the same handle. On the other hand the cup on the right which is a "urea" moulding has no such crazing at all. The reason may be due merely to the design of the handle. Following a discussion at the works of Ranton and Co., Ltd., on the subject of obtaining greater adhesion of film, it was decided to decorate similarly two "half-cured" melamine cups. These are now in process of treatment and a report will be made in due course.

Fig. 7. Child's cups, saucer and plate of melamine.

Fig. 8. Melamine and (right) urea cups hand-painted with designs followed by clear lacquer spray and stoving. Note high glaze after 2½ months use.

Production Story

The vacuum-cleaning industry represents a growing field of application for plastics. We describe here work now being carried out by British Moulded Plastics, Ltd., with special reference to the use of thermoplastic compounds

Fig. 1. General view of injection division.

THE modern streamlined vacuum cleaner is a far cry from the heavy and inefficient sweeper of the early 20th Century. Perhaps one of the biggest factors influencing the growth of the vacuum cleaning industry has been the steady decline in the availability of domestic help; this, coupled with improved efficiency in electric motors, has been responsible for the introduction into practically every household of vacuum cleaners ranging from the very small cylindrical models to the large upright machines.

Just how great has been the change is shown in Fig. 2; two models are portrayed here, the first the Star vacuum cleaner operated by bellows, a very early model, and the second made by Vactric, Ltd., a 1955 version. These show very well the great change that has taken place in the conception by the designer of what a vacuum cleaner should look like, and what it should do.

The plastics industry has a very direct interest in progress in the vacuum-cleaning field, since it is becoming more and more apparent that moulded and extruded components can offer significant advantages.

The tonnage of plastics materials employed must now be considerable, since there is no cleaner or polisher in large-scale production in this country today which does not employ plastics parts in one form or another. Apart from the use of thermosetting materials in the form of switches, handles, threaded couplings, cover mouldings, etc., there is now a definite trend towards the wide use of thermoplastic materials, for a number of very good reasons. Such materials offer economy in weight, enhance the appearance of a machine by virtue of wide colour range, are highly resistant to impact and consequent breakage and afford considerable protection against damage to furniture.

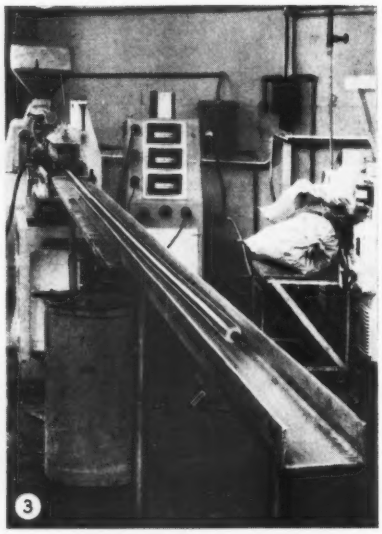
Fig. 2. The old and the new.

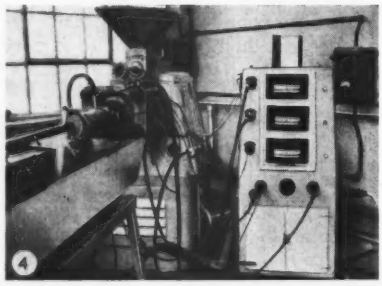
This Production Story is therefore concerned with the moulding and extrusion of thermoplastics compounds for the vacuum-cleaning industry, with special reference to the work of British Moulded Plastics, Ltd. As one of the biggest moulding organizations in the world, British Moulded Plastics have links with every major industry in Britain and the vacuum cleaner is rapidly coming to the fore as one of the major outlets for the company's products. The company employs over 2,000 people. Apart from toolroom, design and administrative offices, the works are divided into the compression division, where press capacity ranges from 10 to 2,000 tons, injection division with capacities from 1 to 36 oz. and the extrusion division comprising plant up to 4½-in. screw diameter. The company, in its present form, was registered in 1942, but has developed from forerunners going back to the first world war.

Extrusion

The main applications in commercial use to date in the vacuum-cleaning field fall into two distinct classes, mainly rigid tubes from which are produced such articles as crevice nozzles, hose couplings or "bends," straight extension tubes which are made so that they can be telescoped together, and handles or poles for the upright type of cleaner; secondly the manufacture of flexible sections from which are made buffers, furniture guards, sealing rings and gaskets, etc. For the manufacture of the first group, although several thermoplastic materials are available, the one which has found wide acceptance to date is unplasticized rigid p.v.c. Advantages include high mechanical strength, dimensional stability, resistance to abrasion and scratching, attractive colour range and, most important, lightness in weight. This material also attracts the fabricator for its ease of handling and ready availability in a considerable variety of grades.

The sequence of operations carried out by British Moulded Plastics in the production of rigid extruded accessories is basically the same whatever variations in the final design the user's specification may demand. It consists of the extrusion of the tube and its cutting to the desired length, its fabrication by an established forming technique in jigs built specially for the purpose and the final operations of trimming (to remove swarf or excess material), drilling or tapping of





3. Extruded tubing carried away along channel.

4. Extruder, showing forming die.

5. Operator inserts mandrel into heated tube section. Rim of oil bath can be seen.

6. Extension tubes.

7. Complete unit with cleats and handle.

8. Cleaning nozzles.

9. Cleat mould.

10. Handle mould.

11. Nozzle mould component parts.

12. Nozzle mould closed.

13. Upperside of nozzle head.

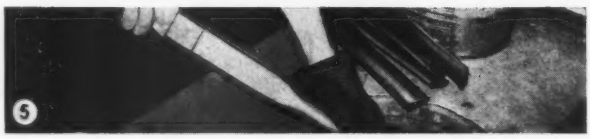
14. Underside of head.

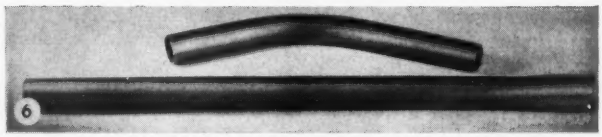
holes where necessary, polishing and shot or sand blasting. The products are then inspected, packed in sets and dispatched.

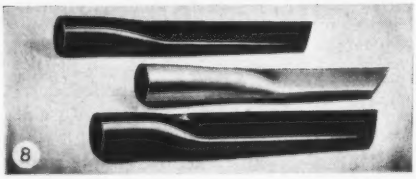
Fig. 3 shows the first stage in this series of operations. The extruder, coupled up with a water-cooling system and take-off machine, is producing standard ranges of rigid tube, shown here being carried along the metal channel prior to cutting. The extruder is coupled to the control mechanism seen to the right. Fig. 4 is a close-up view of the die head showing the cooling water being sprayed on to the tubing after leaving the forming die. The barrel and die are being run at temperatures in the order of 160° C.

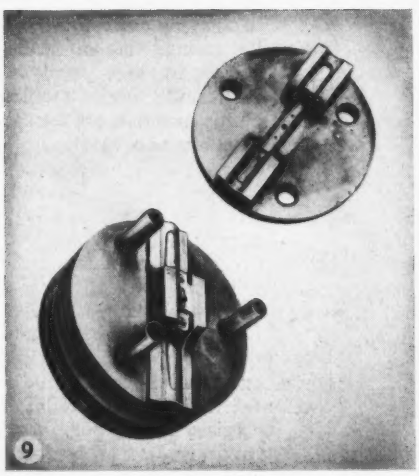
In Fig. 5 short lengths of tubing are seen being formed into the finished shape, in this case as crevice nozzles, by means of specially shaped mandrels. The tube sections are first immersed in a heated liquid medium such as oil to bring the rigid p.v.c. to the point where it can be deformed accurately and without difficulty. Only high-quality extruded tubes can be used for this work. The tube itself must be made to accurate tolerances and be free of strains. Such strains are attributable to cold flow, drag lines or powder contamination, and any fault will immediately be apparent as soon as the tubes are subjected to heat before forming, resulting in wholesale rejection.

The main emphasis in the production of high-quality cleaner accessories of this type lies, however, in the skill and care taken during fabrication. Whatever method of applying heat to the tube section is employed, the design and construction of any jigs and fixtures must be of a high standard and operators must be specially trained for the work. The immersion of the tubes in fluid at a thermostatically controlled temperature is one widely adopted practice although others are available, including high-frequency heating. The temperature which is used, the period of immersion and the cooling operation, are three factors necessitating very careful control.









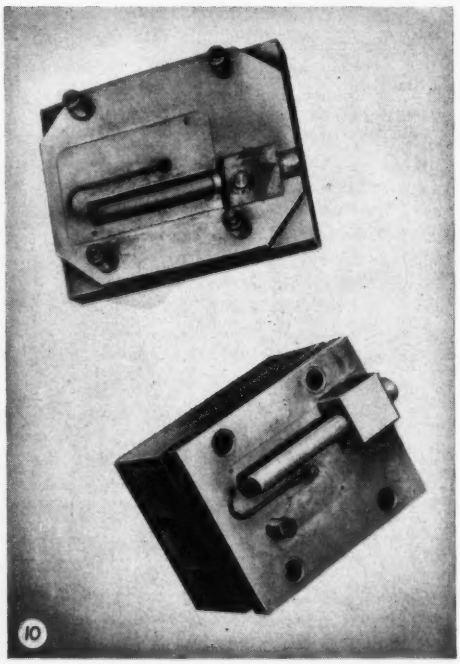


Fig. 6 shows two lengths of extension tube, both of which have been post formed, so that they will slot together as required. A feature of rigid p.v.c. is that when two lengths are slotted together it is extremely difficult to pull them apart thus making for efficient use but they are easily separated by a slight turning movement. They are therefore locked in position without undue pressure and without special locking devices such as screw threads, both important from the point of view of the ultimate user. This property may hold possibilities in many other engineering problems. Fig. 7 shows a complete unit fitted with flexible p.v.c. handle and two moulded p.v.c. cleats round which the flex is wound. Again tube fabrication is carried out in the manner described above. Fig. 8 shows examples of polished cleaning nozzles fabricated by the technique shown in Fig. 5. The pattern has been modified in each case to meet the requirements of the individual cleaner.

Flexible Extrusions

Here again p.v.c. is preferred, primarily because of its compatability with additives such as plasticizers which means that formulations can be readily prepared for specific applications. This means that the final component can be tailored to fit the design of the individual purchaser. Most of the buffers, gaskets, and other components supplied to cleaner manufacturing companies are to their own design and specification. With very little outlay on dies or tooling, the purchaser can have available a wide range of sections either in length, colour or contour, and capable of being varied at short notice.

The method of manufacture is little different from that already described. The material is extruded to the required design and either coiled or cut to length as desired. It is then butt-welded or formed by heat.

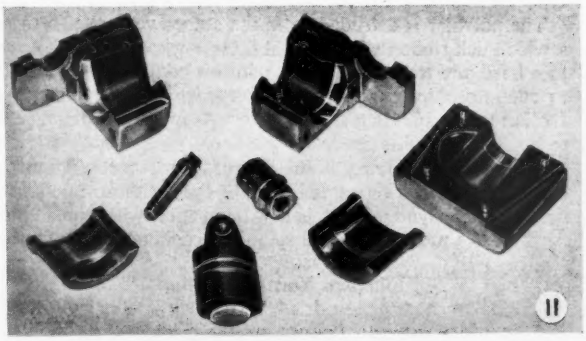
Moulded Components

Amongst the many thermoplastic mouldings currently manufactured by British Moulded Plastics, are cleats for carrying the flex when not in use, handle grips, brush holders, and dusting nozzles. These are manufactured in cellulose acetate and p.v.c. Fig. 9 shows the two halves of an injection tool for moulding cleats, a two-impression mould. Here cellulose acetate is used, with excellent results. The resultant product is fixed by means of a screw to the handle as shown in Fig. 7. For mouldings of this kind, a 2 oz. machine will suffice. Fig. 10 is a single cavity tool for the injection moulding, in plasticized p.v.c., of the cleaner handle. On the right can be seen the movable core which at the commencement of the cycle is drawn back into the cavity, the tool being moved into the locking position against the die plate shown left. The material is fed from the barrel through the sprue clearly seen on the die plate, round the runner and through the gate into the cavity. When the tool is open, the moulded component, with sprue, is brought clear of the cavity by the core after which it is stripped off, whilst still warm. The nozzle head shown in Fig. 13 and 14 is moulded in Vybak p.v.c. copolymer material (manufactured by Bakelite, Ltd.) with the aid of a complex multi-part tool. The components are shown in Fig. 11, and it will be seen that it consists essentially of two cores, making possible the moulding of the complex section required. This is a hand tool which is extracted from the press in the closed state seen in Fig. 12, taken to pieces by the operator, the moulding extracted and then re-assembled for the next cycle. This is an excellent example of an extremely difficult section required by the customer being produced at economic levels. In Figs. 13 and 14 can be seen underside and topside views of two typical specimens.

Conclusions

Both in the extrusion and moulding field, production for vacuum cleaners at British Moulded Plastics occupies a sizeable proportion of the company's overall work. Many hundreds of thousands of feet of tube alone have been absorbed. Apart from the advantages which have been apparent in the above notes, the use of plastics assists the vacuum cleaner manufacturer in one very important respect. With plastics any product finishing such as galvanizing or anodizing, which would be necessary with metal, is eliminated, the product being non-corrodible. It can therefore be expected that an ever increasing tonnage of thermoplastics materials will be directed into this field and it is certainly to the credit of British Moulded Plastics Ltd. that they have pioneered this hitherto small field of application for extruded accessories and parts with such success.

In conclusion we wish to thank Mr. T. Corbin, Sales Manager, and Mr. R. G. L. Welham for their assistance in the preparation of this report.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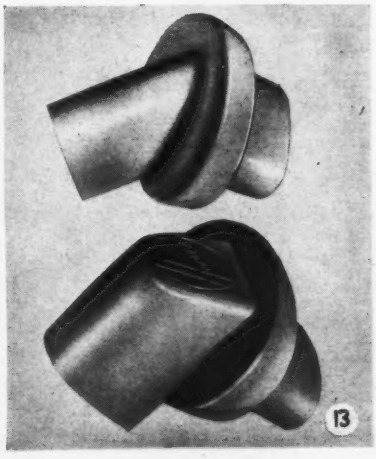
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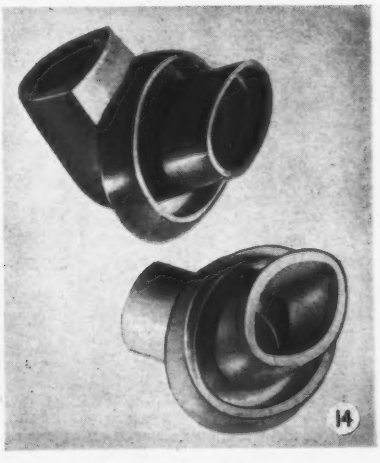

14

"Terylene" Production Begins at Wilton

NO doubt it is somewhat foolish and perhaps rather difficult in the year 1955 to evaluate the implications, in terms of costs, labour, space, geography, including changing climatic conditions, politics and world strategy, of a completely synthetic fibre factory costing, perhaps, £15,000,000, covering a mere 30 acres, but producing 10,000 tons a year, with the output of a similar area in the cotton fields of the United States or Egypt or on the sheep farms of Australia. Quite foolish now, but it might prove more interesting, and even more important, to do so, say, in 1985. Let us wait until then for the answer.

Two-and-a-half years ago the foundations of a new chemical and polymer plant were laid by Imperial Chemical Industries, Ltd., at Wilton, in North Yorkshire, now part of the vast network of chemical factories that began across the Tees little more than 25 years ago, where fertilizers such as ammonium phosphate, petrol from coal, alcohols such as the glycols and the newer nononol, plastics such as "phenolics" and "ureas," "acrylics," polythene and p.v.c. are made to feed the industries of much of the world.

Two-and-a-half years only have passed and today the new additional factory is producing "Terylene," the latest completely man-made fibre, at a rate fast approaching its capacity of 5,000 tons a year. By the end of this year the second unit will be in operation, when the total production will be 10,000 tons a year of both filament and staple fibre for combining with natural fibres such as wool.

No other factory has given us to the same extent the thrill of understanding the impact of chemical and engineering sciences on modern production methods. No other has shown us so clearly and completely under one roof, so to speak, the power of science to serve mankind in its peaceful pursuits.

Here, nearby, we see the conversion of petroleum into gases by a cracking process or by separation into pure entities, resulting in the bulk production of the two main raw materials, ethylene gas on the one hand and para xylene, a compound resembling benzene, on the other. From ethylene is made ethylene glycol and from the xylene is made, first terephthalic acid by interaction with nitric acid and then dimethylterephthate by treatment of the acid with methanol. The two principal reactants, ethylene glycol and dimethyl-terephthalate, are then heated together to produce the monomer dihydroxymethyl terephthalate which, when polymerized in autoclaves at high vacuum and at high temperature, result in a tough, white, solid polyethylene terephthalate which is the "Terylene" polymer.

The polymer is extruded from the autoclave in the form of a wide thick ribbon which is cast on to a wheel, where it cools to a hard and tough solid strip. In this condition it is simple to cut into chips suitable for conveyance through piping by suction to the spinning section, where they are dried and pass to hopper reservoirs ready for melting.

The spinning building, in the eyes of normal textile spinners, may be considered very small. In the eyes of those who know only the new synthetics, it is a vast creation with bank upon bank of the most up-to-date spinning machines in the world.

Filament Yarn Production

The polymer chips are dried, to remove residual moisture, and are then put into hopper reservoirs ready for melting.

Fig. 2. — The autoclave floor in the polymer building. Terylene polymer in the molten form is then delivered on to casting wheels below.

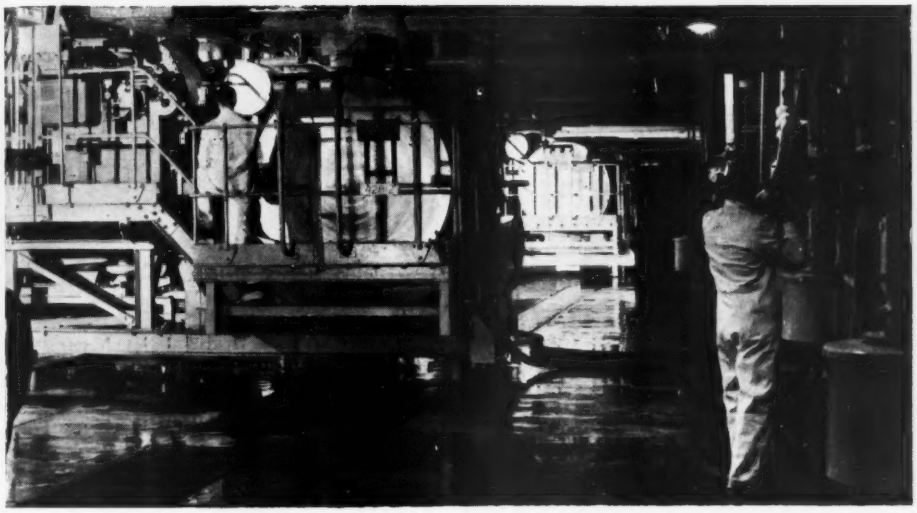


Fig. 3. The polymer is extruded from the autoclaves on the floor above on to the casting wheel shown in the photograph. It solidifies on the wheel in the form of a ribbon and is then cut into chip form in dicing machines.

The molten polymer is extruded at high pressure through the holes of a plate known as a spinneret, and the individual filaments solidify, are drawn together and wound on to cylinders as undrawn yarn. This yarn is then taken to draw-twist machines, where it is stretched to several times its original length to increase the tensile strength and wound on to bobbins. Constant testing of yarn samples and analysis of results is necessary to maintain the high standard of quality required.

Much of the " Terylene " yarn made at Wilton will undergo a further process in the hands of the textile industry to insert twist, which is necessary for many applications. The twisted, or " thrown," yarn is heated in an oven to stabilize the twist and then wound on to cones. Wilton itself is producing a small amount of " thrown " yarn, but it will all be exported.

Two varieties of " Terylene " filament yarn are produced, each in a range of deniers (or thicknesses). These are: (1) Yarns of normal strength, used principally for clothing. (2) High-tenacity yarns. These are given extra tensile strength during processing to fit them for industrial purposes. Both bright and delustred yarns are made.

Staple Fibre Production

The polymer chips are dried and put into hopper reservoirs ready for melting. Extrusion of filaments takes place on a much larger scale than in the manufacture of filament yarn and the filaments are brought together to form a thick tow. This tow is drawn, then crimped mechanically and the crimp stabilized or " set " by heating. The tow is cut into specified lengths (according to the textile process for which it is intended) and baled.

" Terylene " staple fibre will be made at Wilton in deniers and staple lengths suitable for spinning on the worsted, woollen, cotton and flax systems.

At this point a few words must be mentioned regarding the industrial uses of the fibre. About 50% of " Terylene " will be used for this purpose. Its great strength wet or dry, resistance to abrasion, to chemicals, fungi and bacteria, and to high temperatures, together with good electrical properties, make it of exceptional importance to the manufacture of fishing lines and nets, tug ropes, chemical filter cloth, taper and sheet armature insulation, fire hose, conveyor belting, tents and car hoods, tarpaulins, tyre cords and industrial clothing. At some future date we shall have " Terylene " film for a number of applications. As for moulding material, some interesting examples have been made already, but we await a complete evaluation of the results to acclaim the full story of applications of one of the most remarkable materials of modern times.

Fig. 4. Charging of heating oven to stabilize that portion of filament yarn that has been " thrown " or " uptwisted."

Fig. 5. Every bobbin of "Terylene" yarn is examined for faults : in winding, traces of oil, finger marks, etc.

PLASTICS
IN THE SERVICE OF MAN

A pictorial review of high-quality units moulded or otherwise fabricated in Great Britain . . .

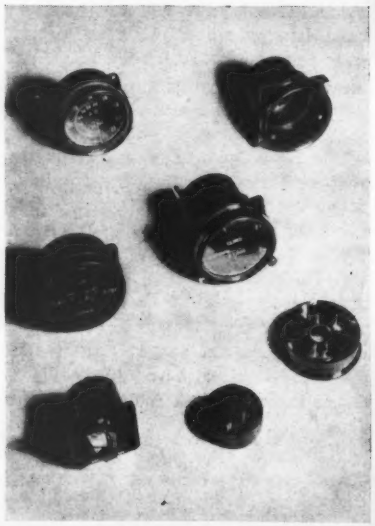
54. The Fighting Services - I

A list of trade-marks and companies mentioned in this review, with full names and addresses, appears on page 63.

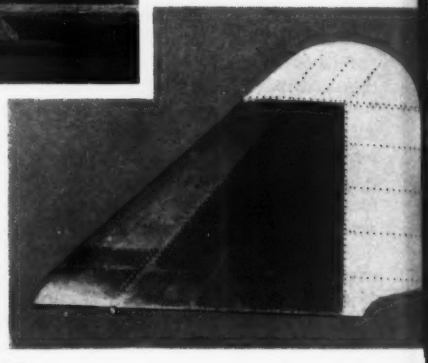
(Above) Auster Mk. 9 A.O.P. fin and elevator tops of Durestos resinated asbestos felt.

(Left) Nose of the Avro Shackleton reconnaissance aircraft showing the glass fibre reinforced plastics radome.

(Above) Cockpit hood of the Gloster Meteor 8 fabricated in Perspex.



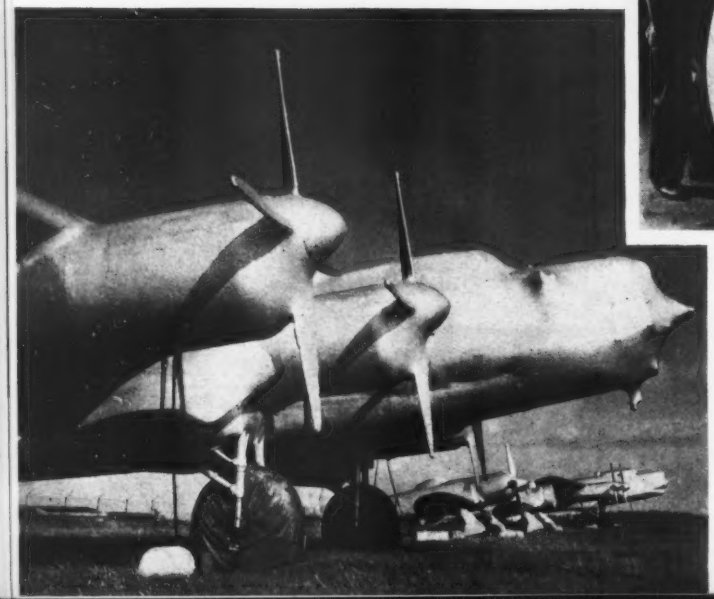
(Right) A selection of instrument housings moulded in Bakelite phenolic material.



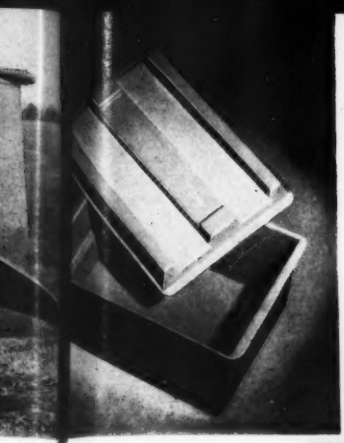
(Below) Perspex scanner fairing used on Short Sunderland flying boat.

(Above) Aircraft fin with glass fabric/polyester resin tip and trailing edge manufactured by Aeroplastics Ltd., for Fairey Aviation Co., Ltd.

(Below) Glass fibre/polyester resin aircraft components for Fairey Aviation Co., Ltd., manufactured by Aeroplastics Ltd.



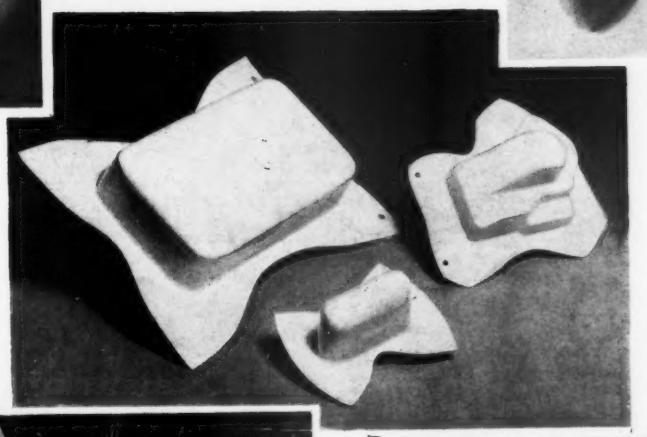
(Left) Cocooned aircraft protected by two layers of sprayed plastic skins (vinyl resin solution) and a third bituminous skin covered with aluminium. (*Plastics*, 1951/Dec./344.)



(Left) Vacuum preformed aircraft battery box manufactured by British Moulded Plastics Ltd., from glass fibre bonded with Bakelite polyester resin.

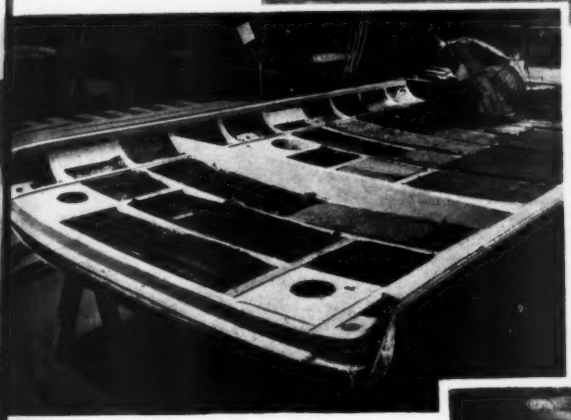
(Below) Winch part covers and a battery tray formed from B.X. Plastics Cobex p.v.c. used on the Westland S.55 helicopter.

(Above) Air-sea rescue pack in post-formed Bakelite material and sea-water de-salting apparatus in Perspex containers.

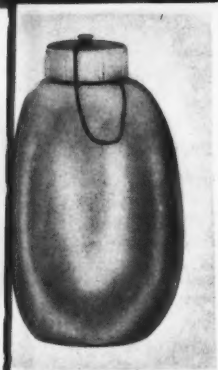


(Below) Fitting Isoflex cellulose acetate insulating pads, to an army mobile workshop roof.

(Below, left) Air diffusers for marine ventilating systems made by Norvent Ltd., and moulded in urea.

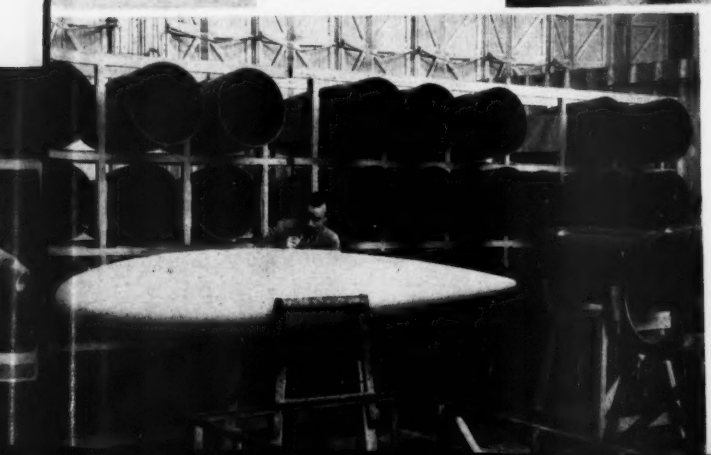


(Above) Electrical cable insulated with p.v.c., the reinforced cable is also wound with polythene barrier tape. Manufactured by Aerialite Ltd.



(Left) Polythene army water bottle and cap with nylon cord. (Crown Copyright Reserved.)

(Left) Nylon glider tow ropes and marine tow ropes manufactured by British Ropes Ltd.

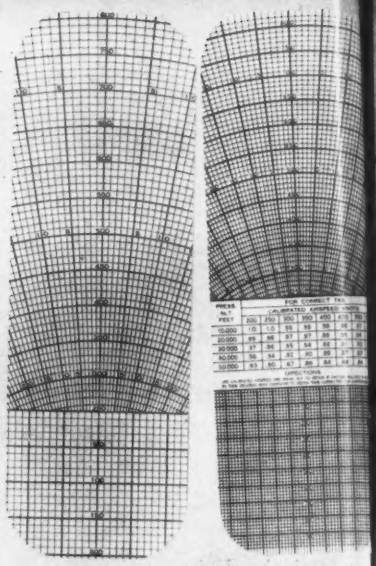


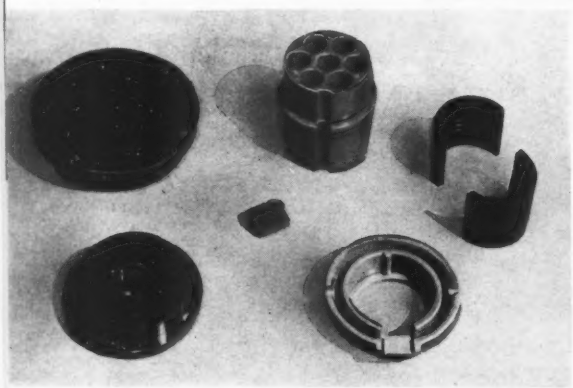
(Right) Lifebelt lights with polythene battery sealing and plastic lamp domes as described in *Plastics*, April 1953, manufactured by McMurdo Instrument Co., Ltd.

(Left) Hawker Hunter 100-gallon drop tank, manufactured by The Bristol Aeroplane Company Ltd.

(Above) Aircraft compass housing moulded by British Moulded Plastics Ltd., in acrylic material for Kelvin and Hughes (Industrial) Ltd. (*Plastics*, 1951/Oct./291.)

(Below) Polyvinylidene chloride monofilament manufactured by B.X. Plastics Ltd., woven to form insoles for army boots.





(Above) Navigational aids engraved on Cobex by London Nameplate Manufacturing Co., Ltd.

(Left) Naval cap lined with Velbex p.v.c.

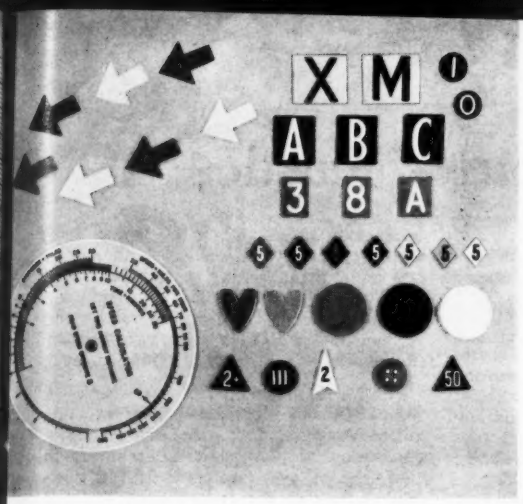
(Above) A group of electrical components moulded in Bakelite alkyd material.

(Above) Royal Marines dory made by W. and J. Tod, Ltd., of glass cloth/polyester resin laminate.

(Left) Polythene and rubberized hair used in the packing of airborne electronic equipment. (*Plastics*, 1953/Feb./46.)

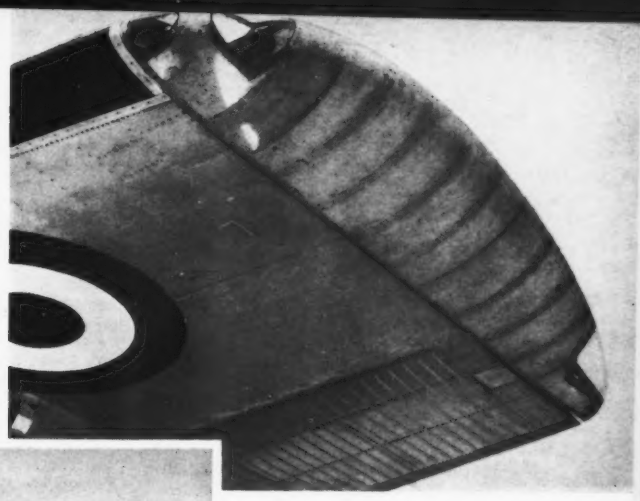
(Below) A glass fibre reinforced polyester resin hull designed by the Admiralty and built by Halmatic Ltd.

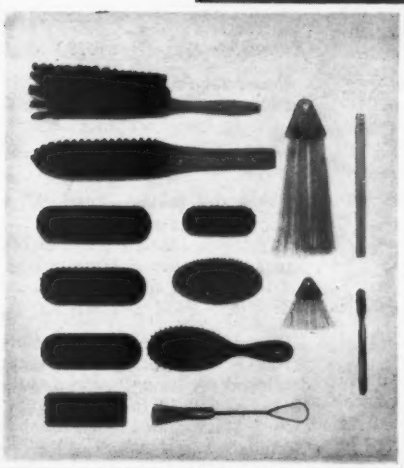
(Left) Smock and trousers, foul-weather clothing for the Royal Navy, made from p.v.c. impregnated cloth.



(Above) Plotting figures and speed calculator engraved on Cobex by London Nameplate Mfg. Co., Ltd.

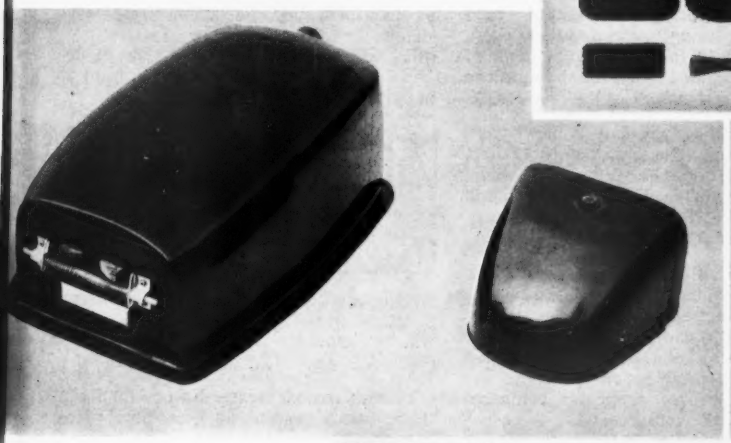
(Right) Wing tip of the Short Seamew made from polyester/glass fibre laminate.



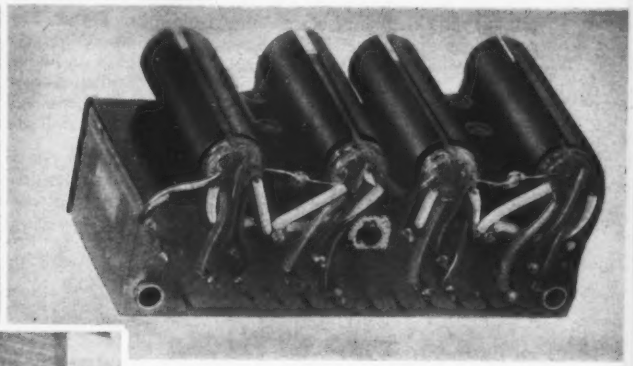


(Left) Selection of brushes incorporating nylon, polythene and cellulose acetate. (Crown Copyright Reserved.)

(Below) Durestos air intake of the Auster Mk. 9 A.O.P.

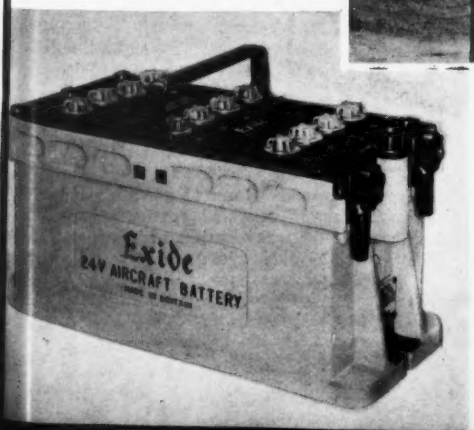


(Below) Electrical components potted in Bakelite polyester resin.

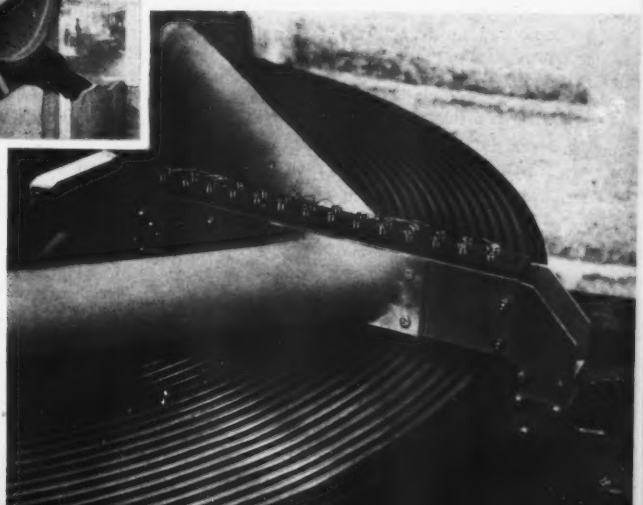


(Right) Aircraft engine packed in p.v.c. compound by Export Packing Service Ltd.

(Below) A section of a helicopter test rig showing the Tufnol brush holders mounted on a steel frame.



(Left) 24-volt light-weight battery with moulded case in polythene (Chloride Batteries Ltd.).



World's Industry Employs Plastics

MATERIALS and TESTING

Rigid and semi-rigid p.v.c. insulations.—J. L. Foster gives a survey of properties and processing conditions for semi-rigid compounds. The processing variations should be easily accomplished in the average wire and cable plant. Applications are: (1) High-temperature appliance wire, (2) high-temperature hook-up wire, (3) all regular cord and wire applications where flexibility is not a major factor.
(*Wire and Wire Products*, 1954/Nov./1331.)

How to avoid sink marks, bubbles and stresses in injection moulding plastics.—Thermoplastics with thick walls or variations of thick walls are often difficult to produce by injection moulding. Several production methods and mould forms are discussed and possible improvements indicated.
(*Kunststoffe*, 1954/Nov./525.)

Tracking resistance.—H. Suhr, in a paper before the German Plastics Conference, 1954, Stuttgart, reports on comparative investigations into the methods proposed in the German Standard DIN 53 480 determining tracking resistances. In certain cases drop and immersion methods do not yield the same results. The ASTM test D45-48 T is in substantial agreement with the German methods.
(*Kunststoffe*, 1954/Nov./503.)

Allyl-melamine-ether.—G. Widmer shows that allyl-melamine-ethers, when combined with air-drying binders of an oil basis (in particular alkyd-resins) give similar results as urea-resins and melamine formaldehyde resins, when only subjected to air drying at room temperature.
(*Schweizer Archiv f. angew. Wissenschaft and Technik*, 1954/Nov./345.)

Urea resin moulding masses.—A German draft Standard DIN 7708, Oct., 1954, has been prepared giving detailed information on types, minimum requirements for physical properties, testing, test reports and other information.
(*DIN-Mitteilungen*, 1954/Nov./483.)

Decorative finishes for plastics.—A stipple coating gives a textured base for applying coloured finish coatings. Another finish produces a spatter effect and is available in a variety of colours. It may be backed with a continuous coating of another colour to give a two-colour finish.
(*Materials and Methods*, 1954/Nov./143.)

P.v.c. foam materials.—E. Baschant deals with the development in this particular field and points to possible future developments.
(*Kunststoffe*, 1954/Dec./542.)

Experiences with polyurethane foam.—Foams of polyester and di-isocyanate basis have recently gained in importance. After development of a satisfactory production technique, suitable types have been produced in which the ratio of volume to weight, pore size and physical properties can be varied considerably.
(*Kunststoffe*, 1954/Dec./555.)

Physics of natural foams.—Latex foams have found a wide field of application owing to their excellent properties, in particular high elasticity. The material was found useful as electrode covers in short-wave therapy owing to its good dielectric properties.
(*Kunststoffe*, 1954/Dec./558.)

Urea-resin foam.—The composition, production and application of urea formaldehyde resin foams are discussed critically by R. Klingholz.
(*Kunststoffe*, 1954/Dec./547.)

Polystyrene foams.—Research has led to the development of a number of foams, such as Styrofoam (America) and Styroper (Germany). These are in large-scale production and have found significant practical uses.
(*Kunststoffe*, 1954/Dec./551.)

Silicone foams.—Three different types of pre-mixed silicone powders have been developed producing materials of 10 to 14, 12 to 16 and 14 to 18 lb./cu. ft. density. Only heat is required to expand the powders.
(*Materials and Methods*, 1954/Dec./102.)

Nylon moulding powder.—A new nylon moulding powder for injection moulding, has an addition of molybdenum disulphide, which gives a low coefficient of friction and excellent wear characteristics.
(*Materials and Methods*, 1954/Nov./142.)

New American high polymers.—H. Mark describes new flame-resistant plastics of high impact strength. They are highly fluorinated acrylics of satisfactory chemical resistance and toughness at low temperatures. He deals also with the combination of derivatives leading to improved properties compared with those of the constituents.
(*Kunststoffe*, 1954/Dec./541.)

INDUSTRIAL APPLICATIONS

Polyethylene cable guard. — Prelashed cables with tightly wrapped continuous wire lashing, require an easily installed sheath protection. A short length of polyethylene tube is fitted over the cable, split lengthwise and inserted under the lashing wire.
(*Bell Laboratories Record*, 1954/Dec./475.)

Neoprene coatings.—R. B. Seymour considers Neoprene the best all-round organic coating. He enumerates 10 important criteria a coating has to fulfil.
(*Materials and Methods*, 1954/Dec./93.)

Casting and potting resins.—Many electronic assemblies are supported or encased to withstand rugged usage, in particular, military equipment must operate efficiently under extreme conditions of temperature, moisture and physical shock. A number of new liquid thermosetting resins have proved useful. By a simple pouring and curing process assemblies are safely and permanently encased.
(*Bell Laboratories Record*, 1954/Dec./447.)

Plastics tooling.—R. F. Parks gives a survey of the development in plastics tooling at Beech Aircraft Corp. The first successful application of plastics tools was made in 1945. He believes that plastics might eventually replace the conventional metals entirely.
(*Tool Engineer*, 1954/Dec./73.)

Nylon gears improved by inserts.—Nylon gears are undoubtedly the most promising development in gearing. They suffer, however, from distortion, particularly in the bore, due to climatic conditions. Moulded inserts will eliminate the distortions.
(*Tool Engineer*, 1954/Dec./79.)

Hook-up wire with Teflon insulation.—Coated with a smooth Teflon sheath, a new high-temperature wire is impervious to all commercial solvents. The new wire is made from 26 to 10 AWG, in 14 standard colours, mainly for identification purposes.
(*Wire and Wire Products*, 1954/Nov./1358.)

MISCELLANEOUS USES

Porous Teflon filter.—A new material with a pore size of 9 microns, which will filter out of liquids all particles larger than 3 microns, has been developed. In gas filtration all particles as small as 1 micron will be removed.
(*Materials and Methods*, 1954/Dec./142.)

Plastics coated yarns.—Natural and synthetic yarns, particularly glass fibre yarns, can now be provided single and plied with a uniform coating of vinyl, silicone, silicone rubber, Teflon, nylon, latex and similar materials.
(*Materials and Methods*, 1954/Dec./146.)

Plastics barge.—A shallow-draft, flat-bottom plastics barge of 50 ft. length for inland waterways is constructed of 50 sections for ease of shipping. It is driven by a 165-h.p. General Motors Diesel engine and can carry 5 tons of dry cargo.
(*Materials and Methods*, 1954/Dec./111.)

PROCESSES : MACHINERY

Low-cost plastics sealer.—A simple unit welds vinylite sheets up to 0.012-in. thick. The welded seal is free of pinholes. A device is used to transfer material and equipment across a sealed contamination-barrier while the seal is maintained.
(*Nucleonics*, 1954/Nov./61.)

LETTERS TO THE EDITOR

Correspondents are reminded that a stamped and addressed envelope should be enclosed in all cases where a personal answer is desired. It is understood that any letter received may be published at the discretion of the Editor.

Key-fobs in Plastics

SIR,—We are interested in obtaining motorcar key-fobs with the correct full crest of all the leading makes of motorcars. These crests are to be made of plastics (e.g., Perspex) and the badge of each individual car to be correct in all detail and colouring.

It would be appreciated if you will advise us of the names of several manufacturers who could supply our requirements. To save time we would be glad if you would ask these manufacturers to send us samples with best export prices.

Our firm has been established over 100 years and supplies various lines of fancy goods to the leading stores, jewellers and tobacconists throughout Australia. We also supply other wholesale merchants with various goods.

G. DAMMAN AND CO. PTY. LTD.
C/r. Collins and Swanston Sts.,
Melbourne,
Victoria, Australia.

Plastics Glazing in Showrooms

SIR,—We are regular subscribers to your journal and request you kindly to supply us with the addresses of manufacturers of glass of high transparency suitable for showrooms and windows.

We are the dealers for the products of the Ford Motor Company of Dagenham and are planning the construction of showrooms to exhibit the Dagenham products. We understand that a special kind of plastics glazing is now manufactured in the U.S. (and possibly in the U.K.) for use in showrooms.

NICOLAS STEPHANOU AND FILS.
P.O. Box 406,
Beirut,
Lebanon.

Trade Inquiry from the Philippines

SIR,—As publishers of several magazines, we are taking the opportunity of writing to you in the hope that you may be able to refer us to some reliable suppliers of the following items: polystyrene, polythene, polyvinyl chloride, blended dyes for dry-colouring polystyrene, ink, dyes in roll, embossing machines for the manufacture of plastic sheeting for upholstery, luggage, handbags, billfolds, etc.—54 in. and 60 in. width in embossed roll; printing machine roll type, that could be used for three colourings—for use in printing plastic sheets, 54 in. and 60 in. width.

We have been receiving several inquiries for these commodities from our various customers. We shall be greatly indebted to you if you can refer the above mentioned inquiries to a direct manufacturer who could supply the requirements of our customers; and/or refer them to us and we will write to them direct.

UNION TRADE DISTRIBUTOR
(Manufacturers' Representative).
Room 402-404, Uy Yet Buildings,
217 Dasmarinas Street,
Manila, Philippines.

Moulds in Perspex

SIR,—We are anxious to get into touch with an organization able to construct models in Perspex, and we should be grateful if you will put us in touch with suitable companies.

The models that would be required are for a structural engineering company, and would be of a water tower and an oil storage tank, to be used on an exhibition stand.

CRAVENS ADVERTISING, LTD.
42 Leazes Park Road,
Newcastle upon Tyne, 1.

Vacuum Forming

SIR,—Can you supply us with names and addresses of manufacturers of vacuum-forming machines.

BERNS AND CO.
Brueckenstrasse 59,
Düsseldorf,
Germany.

[EDITOR'S NOTE: Amongst machine manufacturers in Britain are Pulsometer Engineering Co., Ltd., Nine Elm Iron Works, Reading; W. Edwards and Co. (London), Ltd., Manor Royal, Crawley, Sussex; and Latymer Engineering Co., 27a Charles Street, London, S.W.13.]

Replacement for Glass Tubing

SIR,—For some time past, I have been experimenting for certain purposes, using at times $\frac{3}{4}$-in., $\frac{1}{2}$-in., $\frac{5}{8}$-in. glass tubing, but owing to breakages I frequently get held up. In these circumstances, is there a plastics type of tube that is transparent which can be readily cut to size?

Can you suggest a firm that would supply me with a small quantity.

A. E. GOODGER.
36 Montague Avenue,
Sanderstead,
Surrey.

[EDITOR'S NOTE: Polythene tubing, which is reasonably transparent, might be suitable for this application, or transparent p.v.c.]

Casting Resins

SIR,—Can you recommend a book dealing with the casting of plastics materials? Have you also any information on flexible moulds? I am particularly interested in the casting of phenolics and polyesters.

ALFRED OBERMAYER.
Shderot Hanassi 2,
Haifa,
French Carmel.

Vinyl Film Inquiry

SIR,—Could you give me any information about a plastics vinyl film called by the American makers "Contact"?

It appears that this film, 0.004 in. thick, is backed by thin paper, so that it is possible to peel off the paper whilst at the same time pressing the film down into position on the surface to which it should adhere.

THE THRIFT DISTRIBUTING CO.
15 Strain Avenue,
Blackley, Manchester, 9.

High-temperature Plastics Hose

SIR,—We shall be pleased if you could advise us of the name of a supplier of plastics hose (flexible tubing) about 1 in. in diameter, suitable for water at a temperature of approximately 200° F.

M. A. AND E., LTD.
Terrace Road,
Walton-on-Thames,
Surrey.

[EDITOR'S NOTE: The water temperature would be very close to boiling point, and at this point common thermoplastics will soften very seriously and unless supported will sag. The problem appears to call for a specially temperature-resistant material such as p.t.f.e.]

Engraving on Plastics

SIR,—Can you tell us of any rapid method, preferably using power, of removing surplus enamel from the surface surrounding an engraved letter which has been filled with enamel, without taking the enamel out of the letter and without blemish to the surface of the material. The largest letter is 2 in., and the material any of the sheet plastics—engraving materials, Perspex, Formica, etc. We recollect having seen an article in *Plastics* where slide-rule markings were enamel filled and then cleaned off, but no mention was made of how the cleaning-off process was accomplished.

We should also appreciate very much information on the most modern method of making the reversed copy (script and trade marks) used in the production of fluorescent Perspex display signs which are engraved in script on the reverse side.

MODERN ENGRAVERS.
201a Peterborough Street,
Christchurch,
New Zealand.

Paris Plastics Exhibition

(Continued)

Additional Notes on the 3rd Salon de la Chimie et des Matières Plastiques

Fig. 1. Left. The Monsanto-Boussois stand showing the dry-colouring process for tinting polystyrene.

THE notes published in the January issue of this journal on the 3rd Salon de la Chimie et des Matières Plastiques, held in Paris on December 3 to 12, were, the writer hopes, sufficient to give the British reader an indication of the " make-up " of these important exhibitions and of the French plastics industry.

The general impression received was the excellent and simple layout and accessibility of stands because of the straight avenues and crossing lanes akin to the Castle Bromwich system, and therefore a great improvement on Olympia and Earls Court. Many of the large stands were obviously specially designed, but taken as a whole I considered that there is nothing to be learnt in this respect. It was quite evident that stands at British plastics exhibitions are much more carefully designed to give more striking appearances. This is obviously also a reflection of the apparent great differences between the industries in the two countries, for there seems no doubt that the British plastics industry serves industry, and " heavy " industry at that, to a much greater extent than does the French. For example, it is obvious that our own industry is much stronger in thermosetting moulding and produces a much wider range of larger components. The laminated wood section of the French industry which produces structures for the electrical, mechanical and chemical industries is outstanding (it is difficult to praise too highly the products manufactured by the well-known Permali Company). There does, however, seem to be a gap so far as the decorative laminates are concerned. We saw little of decorated p.v.c. for clothing and home use and little of the great variety and excellent quality of "leather" and fabric-backed " leather " we have in Gt. Britain. This is strange, since it is obvious that the French workers do excel in this work. Similarly, although a great deal of extrusion is done, it is not clear how varied it is. There must be little work done for the vacuum-cleaner industry. I have the impression that the aluminium industry, which received such an impetus by the Government after the war, still has a considerable effect on the mind of industry in general.

There was one notable absence, namely the application of plastics in art. It was very much in evidence in previous exhibits, especially in those prior to 1939, before they were designated " Salons." As in this country, there were excellent examples of carvings and statuary. Neither, we suppose, shall we see such exhibits in Gt. Britain in our own exhibitions. It seems a great pity.

Additional Exhibits

Our notes on the actual exhibits have been limited, since our desire has been to report, on the whole, only what is new to this country. Thus an individual examination of each stand has been unnecessary.

In addition to the machines reported in our last issue we noted a new 8-ounce machine by the well-known Etab. Eynard, of Lyon—a powerful apparatus over 13 feet in length, quite devoid of streamlined covering so common here and provided with an overhead gantry and pulleys for the transport of the mould to and from the press. The distance between the mould-carrying plates is about 24 inches.

Of ancillary plant we noted the powder driers made by J. Parmilleux, of Lyon, and an interesting electrically-heated vacuum drying oven for the drying of nylon powders. This company also specializes in infra-red heated stoving tunnels.

High-frequency and other heating plant for welding polythene and p.v.c. film and sheet are common, and a very interesting unit made by S.I.E.F.A.M. drew our attention because of an ingenious application made from it (see Fig. 3). This is a bag about 4 in. by 4½ in. made from lay-flat tubing and sealed at one end. This is converted into a soft-drink container by introducing another small piece of lay-flat tubing to act as a valve. The top edge of the bag is then heat-sealed to itself and to the outer surface of the valve. The latter itself remains open, so that although the bag can be filled with a liquid it cannot lose the liquid by shaking or turning upside down. On the other hand a straw can be inserted into the valve and the liquid can be imbibed.

It is also noteworthy that even with such a simple valve the bag can be filled with air by blowing into it with a tube.

Fig. 2. Drying ovens on the stand of J. Parmilleux of Lyon. On right, an electrically-heated vacuum oven for the drying of nylon.

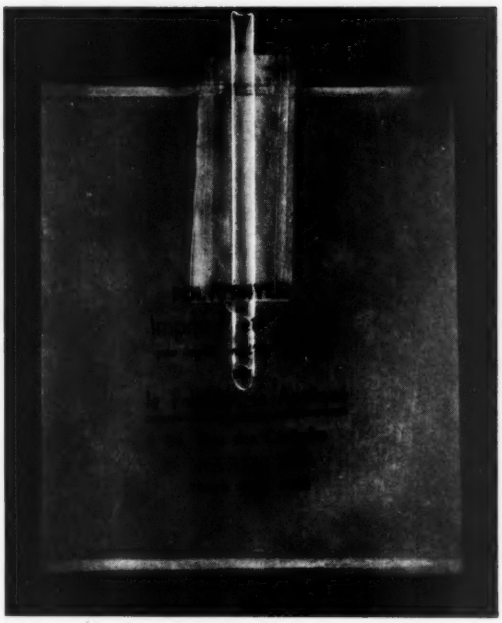


Fig. 3. Ingenious welding of lay flat polythene bag with polythene "valve."

On removal of the tube the bag remains "blown-up"—loss of air under pressure appears to be extremely small. There seems to be the possibility of something quite interesting here. On the other hand, the first use suggested to me, that of holding soft drinks for sale in cinemas is not so attractive!

The welding was carried out on the company's Baby M.A.F., a very small but efficient machine in which the heating is carried out by infra-red rays. The jaws are entirely protected by a plastic material with high electrical and high-temperature resisting properties (p.t.f.e.?). Thickness of films is limited to 0.2 mm. (8/1000 in.), limits of welds are 1 to 6 mm. wide and 160 mm. (6.4 in.) long, and time of welding 1½ to 2½ seconds according to thickness of film.

An important industrial application of sheet welding which is being carried out superbly by several French companies is the welding of polythene and unplasticized p.v.c. for the construction of chemical plant and allied-to-chemical structures, e.g., for electroplating, photogravure, artificial silk and pickling works, etc.

From what I have already said about the large number of small working units in France and the high artisan population, the reader will not be surprised at the quite large sale at one of the stands, H. Blot, 113 rue Saint Charles, Paris (XV), of their "Matiplas" gas and electrically heated welding torches, and their assortment of four differently shaped nozzles. I was by no means surprised to hear that in this field, and in general fabrication, it is easily possible, if one knows where to go, to obtain half a dozen only of a non-standard small fabrication or welded job. I do not know anywhere in Gt. Britain where this would be a welcome order.

I encountered no p.v.c. coating by dipping and curing of wire structures at the Exhibition, but there were a number of examples of similar structures made from p.v.c.-covered wire made by extrusion. Many forms were for the household, coat hangers, clothes driers, shirt and blouse supports for window displays, clothes pegs and so on. I did not think the clothes driers and pegs (Fig. 4) especially clever, since there must be two points at which the steel wire is exposed—

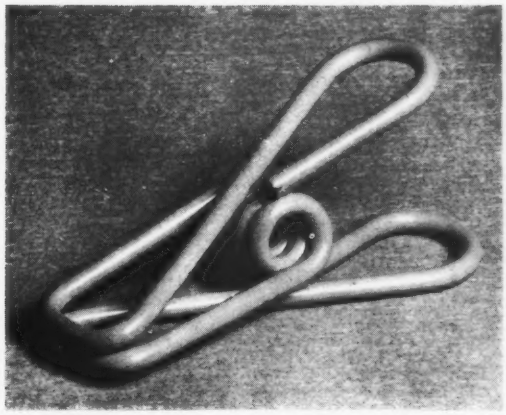


Fig. 4. Clothes peg made from strong wire covered by extrusion with p.v.c. Note that end of steel wire is exposed, which nullifies the effect of the p.v.c.

rusting is inevitable at these points and staining of laundry is a danger.

Additional Notes

I have now received some data regarding the new fluorine resin (of the polychlorotrifluorethylene* class) mentioned in the January issue, now in course of manufacture by Péchiney and which will be available for sale later in 1955. Chemical formula $(CF_2-CFCl)_n$. In the powder form the apparent density is 0.5, while in the moulded form density is 2.1. It is heat-stable up to 270° C. and may be employed as a structure from −60° C. up to nearly 200° C. The coefficient of linear expansion is 5 to 7 x 10^{-5}; it is non-inflammable. The chemical properties are outstanding: totally resistant to water (it cannot be wetted), is quite impermeable to moisture, is insoluble in all solvents although it is slightly swollen by halogenated solvents at their boiling points. It is unattacked by strong and weak acids and alkalies, by strongly oxidizing agents, aqua regia and chlorine.

The new resin can be moulded by compression, transfer, injection or extrusion (in view of temperature of working, up to 280° C. moulds must be of the non-oxidizable type or chromium plated and polished). The resin can be readily filled with quartz, graphite, glass fibre or asbestos.

M.D.C.

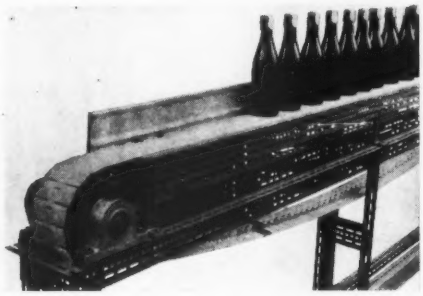
* This class is presumably the same as the American KEL-F type.

Fig. 5. B.I.P. stand exhibited urea and melamine resins, products made from them and technique of gluing. Photographs of presses, pelleting machine and tools were also on view.

Industrial Applications of Nylon

Moulded and fabricated nylon has made great progress in recent years. The following report deals with some of the interesting uses of nylon in three specific industries as supplied by British Rawhide Belting Co. Ltd.

IN THE BREWING INDUSTRY



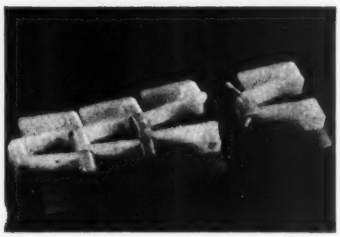


Fig. 1. (Top, left) Nylon conveyor belt.

Fig. 2. (Top, right) Close-up of underneath of conveyor.

Fig. 3. (Right) Test piece after break.

IN recent years plastics have played an increasingly important part in the brewing industry. Polythene, p.v.c., and acrylics, to name only a few, are well established and are being successfully used in all facets of the trade, from the growing of the hops to the serving of the final product at the "local." Today nylon has entered the field and in the new bottling store of Watney, Combe, Reid and Co., Ltd., at Edmonton, can be seen many new applications for this material.

One of the more noticeable applications will be a nylon bottle conveyor. Fig. 1 shows a section of the conveyor not as it will be when finally installed but on a demonstration model. The conveyor is made up from injection-moulded links of approximately 4 in. wide and 2 in. long. The hinge pinion is of steel and is forced into the outer shoulder of one link, the adjoining link being held in the centre. Fig. 2 shows the underside construction of the conveyor. For convenience every 10 ft. a parting link of a different colour is put in, thus providing an easily identifiable separating point for the inclusion of additional conveyor lengths. Reduced noise, wear, friction and power required for operating are claimed and in addition its non-corrosive properties make it suitable for use in the brewing industry. During the development of the conveyor a section was sent to the Sheffield Testing Works, Ltd., for a tensile test. The amazing strength of the conveyor is illustrated by Fig. 3 which is a photograph of the four links which underwent the test. As can be seen it was not the nylon that failed but the steel hinge pins. An extract from the report says "Load applied in pounds, 1326. With this load, one of the pins having bent through an angle of approximately 70°, slipped through one outer eye of one of the links, thus breaking the continuity of the chain. Remarks: The links were deformed, except at the two ends where the testing pins had not bent, and the pins belonging to the chain had bent, but the links would still rotate about these pins." Adequate testimony indeed.

Nylon conveyor is by no means the only application. Turned nylon pipe unions are for all practicable purposes a standard fitting. Two sizes of these joints are shown in Fig. 6, and Fig. 7 shows them in position on a distribution point assembly of a Bowser filter. On the right of the picture the older type of union nut with lugs is shown. One of the advantages of using nylon for this particular application is its resistance to shock and corrosion.

It is necessary at fairly frequent intervals, to sterilize the piping systems of a brewery in order to eliminate any risk of tainting due to bacteria or sedimentary deposits. This will often incur the stripping of the stainless steel piping and the sterilizing of each section by steam or boiling water. This dismantling process caused serious wear and tear on the original pipe unions from hammer blows, but new designs and new materials have now eliminated this. The economies

Fig. 4. (Left) Hand wheels and hose liners.

Fig. 5. (Left) Hop strainer for conditioning tanks.

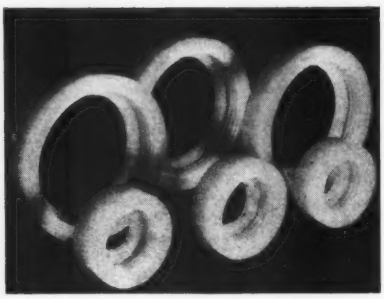


Fig. 6. (Centre) Pipe unions for feed and supply pipes.

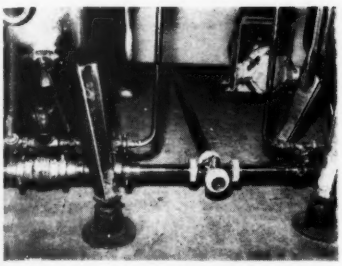


Fig. 7. Nylon pipe unions assembled to a Bowser filter.

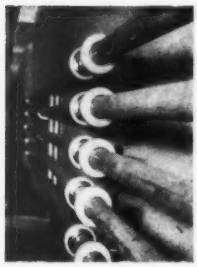


Fig. 8. Battery of feed pipes.

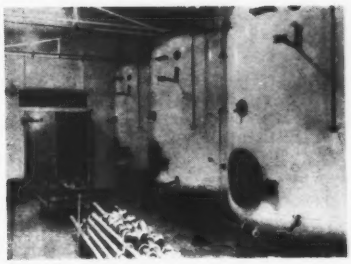


Fig. 9. Conditioning tanks and feed pipes.

from the use of nylon also weigh in its favour. The cost of making a nylon union as compared with a stainless-steel one is far less and in addition the delivery, because of the simplicity of its manufacture, is more a matter of hours than weeks. The nylon is moulded to the size and the thread turned on an ordinary machining lathe. Turning speeds are much higher than for metal. Another consideration is the colouring of the unions thus making identification of different systems easy to follow where batteries of pipes are used. The internal packing washer on the unions is also of nylon.

Fig. 5 shows a hop strainer fabricated in nylon used in the conditioning tanks. These strainers are fitted in the tops of the tanks which are glass-enamel lined and like all filters have to be removed for cleaning periodically. It is in this operation that trouble has arisen due to dropping the metal strainer and chipping the tank lining. The resilience of nylon has now obviated this danger.

Other applications include a turned nylon hose liner and securing nut used to connect flexible hose to the stainless steel piping, nylon adjusting key for the hop strainer, and other components. Besides its properties already evaluated the chemical inertness and its resistance to bacteria make nylon a material which will find many applications in an industry where hygiene and cleanliness are essential. Fig. 9 is a view of the conditioning tanks in which the hop strainer is fitted and in the foreground can be seen feed pipes prior to installation.

Industrial applications of nylon . . .

IN THE ELECTRICAL INDUSTRY

Fig. 10. Switch connector cases. Switch cam arm. Multi-switch cams.

THE electrical properties of nylon although not as good as polystyrene or polythene are sufficiently good to warrant its consideration as a material for the electrical industry. It is not, however, as an insulant that it has found a ready field of application although these properties are important, but advantage has been taken of its higher melting point (in the region of 220° C.) and its superior mechanical properties and lower frictional resistance to the materials mentioned previously. With these properties combined with its electrical resistance nylon has found application in the internal components of multi-acting switches. These switches are worked from a cam which activates an arm which in turn makes the contact. On the right of Fig. 10 can be seen several of these cams and in the centre is a contact arm. These cams are so designed that they can be fitted together to give any series of contacts at a given time. As their diameter is approximately ½ in., and the tolerances allowed in their manufacture are very close, it will be obvious that ingenious and accurate

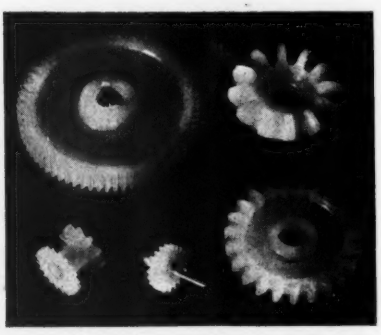


Fig. 11. (Left) Fabricated gears for switch and motor controls.

Fig. 12. (Right) Cable suspender for temporary telephone lines.

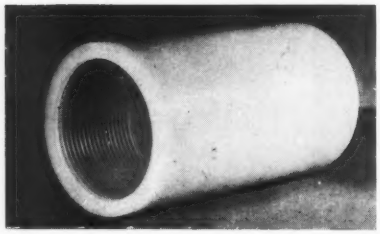


Fig. 13. (Right) Discharge explosion pot with high pressure resistance.

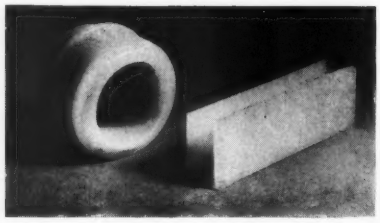


Fig. 14. (Left) Conveyor carrier and lift slide.

mould designing has had to be observed. The method of manufacture is by injection moulding.

Fig. 12 shows an injection moulded cable suspender used for supporting telephone cables where movement of the cable is liable to occur. It is used primarily where telephonic communications are of a temporary nature.

Nylon gear wheels with their low friction resistance which makes a lubricant unnecessary are being used successfully in switch gear and electronic controls. A selection of these is shown in Fig. 11. The explosion pot shown in Fig. 13 is used where an overload will occur and cause a violent discharge. This pot has been tested severely and has withstood pressures of over 1,700 p.s.i. in addition to fracture and wearing tests. The method of manufacture of this pot is by moulding to size and machine-turning the thread at the open end on an engineering lathe.

Nylon components are also used in equipment which is an integral part of the electrical industry; Fig. 14 shows such components. On the right can be seen a lift slide and on the left a conveyor carrier. In these cases advantage has been taken of the mechanical properties, rather than of the electrical properties.

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Industrial applications of nylon . . .

IN THE TEXTILE INDUSTRY

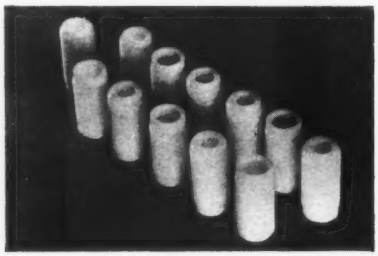


Fig. 15. (Left) Top rollers for use on textile machinery to prevent chafing of the yarn.

NYLON as a fibre is already well known in the textile industry and the increase in its use within the last few years has been rapid. Less well known are the uses of nylon fabrications in textile machinery.

It has always been one of the problems in designing machinery of this type to ensure that the yarn is kept well clear of grease or oil from the lubricating systems. With the advent of nylon gearing this problem has been reduced considerably until it is now only a matter of time before it will be entirely eliminated. Fig. 18 is a photograph of some large and small gears to which the bobbins are fitted. Originally manufactured from cast iron the advent of the nylon gear presented only one problem and that was that the comparative lightness of nylon caused the gears to "jump." The design of the machine is such that the gears are mated by their weight only and to overcome this problem a metal band is now incorporated in the gear design.

Rollers and bearings of nylon are a more common feature on these machines. The top rollers illustrated in Fig. 15 allow the yarn to run cleanly into the looms and it is essential

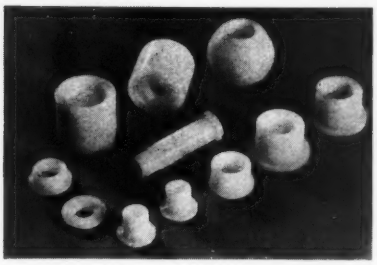


Fig. 16. (Right) A selection of bearings of different shapes and sizes.

for these rollers to have a smooth surface to prevent "snagging" of the yarn. Fig. 16 shows a selection of bearings machined from nylon tube. Dimensional accuracy is an essential in this application as in all bearings.

In all these cases the predominant factor governing the use of nylon has been its ability to run at high speeds without lubrication.

We are indebted to British Rawhide Belting Co., Ltd., 246 Great Portland Street, London, W.1, for the facilities made available to us in the compilation of this report. Certain of the mouldings were carried out by Pendry (Plastics), Ltd.

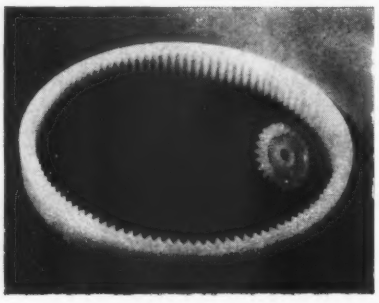


Fig. 17. (Left) Ring gear and mating pinion.

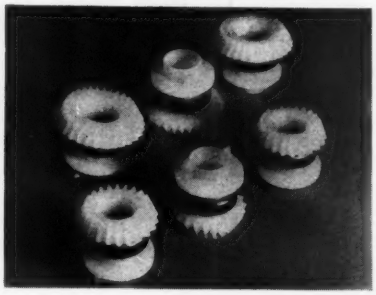


Fig. 18. (Right) Large and small bobbin driving gears with metal rings to add weight.

Packaging Exhibition Review

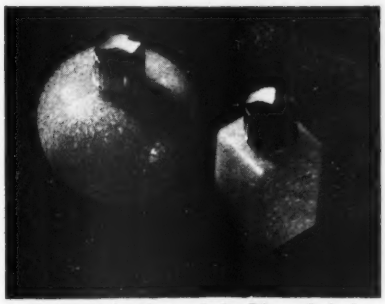
A report of the increasing use of plastics materials in the field of packaging based on the displays at the Packaging Exhibition, held in January, in London.

PILLS to pyrography, lemons to locomotives, all require packaging and protecting and with the realization of the importance of this have come developments, techniques and materials each tailored to fit the job they have to do. The packaging industry, for it is now an industry in its own right, has been successful in always having satisfied the demands of its customers and it is on this basis that the industry has been developed. How successful this development has been was amply demonstrated at

Example of packing in Cellastine.

the Packaging Exhibition held at Olympia during January, when many of the leading companies showed the skill, forethought and care with which each problem is treated. It is a matter of no mean importance that with this increased awareness of its responsibilities the packaging industry has made more and more use of the plastics materials and synthetic resins made available to it by the plastics industry. It will require no feats of higher mathematics to declare that as the packaging industry expands so the consumption of plastics will increase. That it is expanding is apparent by the fact that the 1955 Exhibition was the largest yet staged in this country, and possibly in the world. The marked increase in the use of plastics for packaging in the last two years is confirmed by the increase in the number of stands exhibiting plastics materials.

In the main there were relatively few new materials on show. It would appear that development has been directed to the improvement of existing materials to suit them for specific jobs rather than in the production of new substances for a market already well served by material suppliers. However, a recent development is the coating of paper with polythene giving a material with a very low moisture-vapour permeability, high resistance to fracture at sub-zero temperatures and which will not support mould growth under tropical conditions. The Telegraph Construction and Maintenance Co., Ltd., who were demonstrating its potentialities as a packaging medium have recently commenced production on a plant capable of applying continuous coatings of Telcothene to a variety of papers in widths up to 6 feet. Also on their stand was a metal foil laminate comprising Kraft paper, aluminium foil and Telcothene, used for the packaging and storage of Service equipment, and Telstic, a heat and pressure sensitive compound applied as a coating to special types of paper, aluminium, and tin foils. Clyde Paper Co., Ltd., was another manufacturer who had a variety of polythene coated papers on show. In addition to the coated Kraft papers, they exhibited sacks coated internally with polythene and sacking laminated to polythene-coated paper by bitumen. Probably the biggest customers for this new product are the chemical fertilizer manufacturers using multi-wallpaper sacks or polythene-coated sacks, the low moisture-vapour permeability of the laminates making it an ideal material for this application. Closer to the home and with an even greater potential market was a Hermetet carton, which is being adopted by the frozen food industry in Sweden. The package consists of a cardboard carton with an inner liner of polythene-coated paper, which is heat sealed. It is particularly suitable where wet foods are to be frozen. Various other polythene laminations are in the process of development, and it would appear that there is a very good market awaiting them.



Cosmetic bottles made by Fibrenyle Ltd.

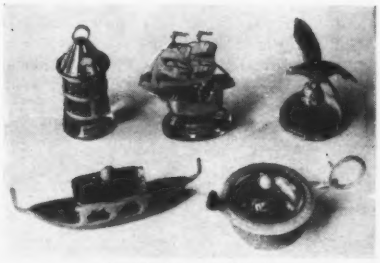
The versatility of polythene as a packaging material has been apparent for many years and the latest application which was on show on the stand of Cascelloid, Ltd., is the polythene Tuboplast which looks as if it may be a serious competitor to the present day foil tube. It can be attractively printed in up to four colours and its extreme toughness and flexibility will reduce the possibility of leakage from splitting to a minimum. Polythene containers of ½ gallon to 10 gallon capacity, polythene bottles and polythene lay-flat tubing, together with injection mouldings and transparent acetate lids and boxes complete the display. The printing, both on the polythene and the acetate, was of a very high standard and showed a considerable improvement on previous years.

Another manufacturer of polythene bottles who showed their products are Fibrenyle Ltd., who have increased their range of Skylon bottles and jars by the addition of some attractively designed and coloured cosmetic bottles. Also on their stand was a blown polythene baby's feeding bottle.

Custom moulding of bottles seems to foster ingenuity and symmetry of design. The attractive display of Blewis and Shaw (Plastics) Ltd. certainly seemed to bear out this statement and, with the addition of the injection-moulded containers, it provided a good illustration of the use of plastics for attractive packaging.

Polythene lay-flat tubing and bags, which have now become a standard pack in so many varied fields, were displayed on many stands, including Anglo-American Plastics, Ltd., Metal Box Co., Ltd., Spesco (Developments), Ltd., British Visqueen Ltd., and British Cellophane Ltd. In addition to the increasing quantity of material now available several improvements have been made, noticeably in the preparation of the film, for printing with consequent improved adhesion and the de-staticizing of the bags (by British Visqueen) enabling quicker handling and easier filling operations. Polythene tubing is now available in widths of 100 in., or as sheet up to widths of 200 in., thus increasing the range of products which will benefit from its fine packaging properties.

The most notable advance in the field of packaging has been in the food industry. The signs of this which were apparent at the Food Fair have now been confirmed at the Packaging Exhibition. The increasing number of self-service shops and greater public interest in food hygiene have both contributed to the expansion of this trade and the availability of new and improved plastics materials have in turn satisfied the new demand. Among these new materials is Cellastine, an air permeable transparent cellulose acetate film manufactured by British Celanese Ltd., which made its debut at the Food Fair. The necessity for an air permeable wrap for vegetables, fruits and berries can be understood when it is realized that although separated from the parent plant these products continue to breathe, lose water vapour and carry on the slow chemical change common to all living



Moulded scent bottles.

Tuboplast Polythene containers.

Wrapping machine by Machinery (Continental) Ltd.

things. It is therefore necessary to provide a film that will get rid of the carbon dioxide formed and replace it with oxygen. Demonstrations of the wrapping of tomatoes in this film by machinery were held on the stand and examples of its use were on view. The sister product of Cellastine, Clarifoil, also an acetate film, which is being used for window cartons was shown in its many applications. These included laminations to metal foils, paper and board. Thicker acetate sheeting formed into display packs by the vacuum forming method were also on the stand.

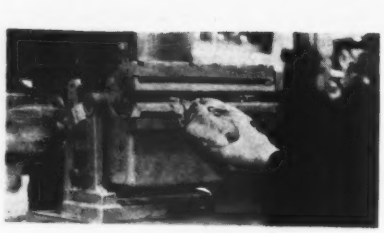
British Cellophane Ltd., in addition to the well known Cellophane cellulose film have expanded their range of wrapping and packaging materials and now include polythene film, cellulose acetate and unplasticized p.v.c., film in their range. Examples of the work of their service department on show included a polythene and board carton container suitable for liquids, and a new polythene bag closure which enables the bag to be opened and re-sealed.

The processes used in the manufacture of cellulose film formed the highlight of the stand of Transparent Paper Ltd. By the use of novel three dimensional photographs in full colour and illuminated diagrams the processing of wood pulp to the conversion of the film was attractively shown and provided an interesting exhibit for buyers who did not know the origins of this material. Examples of the latest techniques in laminating of film to film were also being displayed in addition to some very attractive multi-coloured printing of the film.

Hot dip strippable coatings for engineering components are a comparatively new innovation but, nevertheless, one which has proved of considerable value and which is now accepted by the Ministry of Supply under specification C.S.2468. Croda Ltd., showed the many uses of and the advantages to be gained by this method of protection. Articles to be protected are immersed for five seconds in the coating compound which is held at a temperature of approximately 170° C. Upon removal, the coating solidifies and provides a skin, impervious to corrosive conditions and which will help protect the product from knocks and abrasion. A similar method of protection is afforded by the "liquid envelope" which has been used successfully in many fields. The application of this modified vinyl polymer is by the normal spray gun or dipping process and it is manufactured by Jenson and Nicholson Ltd., who featured its applications on their stand. Some of the applications where this method of protection has been successfully used include the "cocooning" of aircraft, the protection of car bodies during overseas shipment and the coating of metal sheets prior to stamping or drawing to eliminate jig and die marks and surface scratches. Another company who have had considerable experience in this field are the Export Packing Service Ltd. A special exhibit on their stand illustrated the "on site" service and was topped by a model of a mobile crane which had been plastic spray coated. Photographs showed the different types of coating applied, depending on whether it was for long- or short-term storage, and included cranes, guns, aircraft components and generator sets. Also on their stand was a cut-away packing case showing the packing of an R.A.F. ejection seat. The points of interest besides the scientific design of case and cushioning was the use of welded polythene as a moisture-vapour barrier. This was also shown on the stand of Reynolds (Packaging) Ltd.

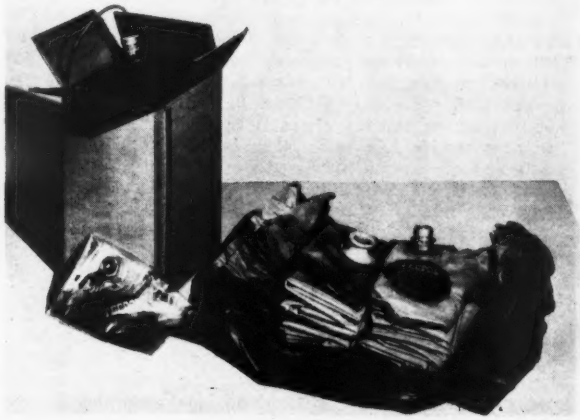
An increased range of sealing tapes using a plastics base were evident on several stands. The Technical Tapes Division of Smith and Nephew Co., Ltd., had produced a reinforced p.v.c. self-adhesive tape. The reinforcing is obtained from a fabric impregnated with adhesive, one side being attached to the p.v.c. and the other left to provide adhesion to the article. By this method the strength of the cloth and the water and moisture vapour proof qualities of the p.v.c. are both used to advantage. Another feature of this tape is that when removed the cementing compound remains on the tape and leaves a clean surface on the package. Other tapes using acetate film similarly reinforced to the p.v.c. film, polythene, and straight p.v.c. as base materials were also displayed.

(Left) Sachet packets produced by Ivers-Lee (Great Britain) Ltd.



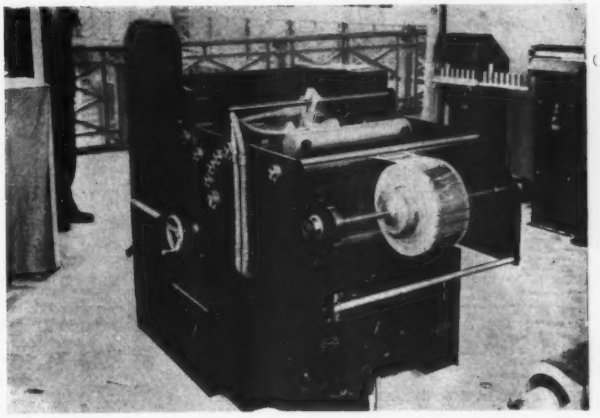
(Right) P.V.C. liquid containers by Plastic Weldings Ltd.

(Left) C. E. Douglas & Co., heat sealer.



(Left) Polythene package seam-welded from sheet. A double weld has ensured a strong product. Printing has also effectively been carried out. Shown on the stand of Charles E. Douglas and Co., Ltd.

(Right) The A. H. Bland (Engineers) Ltd., bag making machine.



Johnson and Johnson (Gt. Britain), Ltd., John Gosheron and Co. Ltd., and the Arabol Manufacturing Co., Ltd., were also showing a range of similar tapes. The latter company, in addition to the tapes, exhibited a range of synthetic adhesives, as also were Gloy and Empire Adhesives Ltd.

A unit packaging service was offered by Ivers-Lee (Gt. Britain) Ltd., on their stand, and numerous examples of the products which they pack were on show. The principles on which this service works are that the bulk product be it liquid, paste, powder or solid is dispatched to Ivers-Lee who then allocate a number of machines solely to the packing of this product. Many shampoo, pharmaceutical, cosmetic and food products are handled. The packaging material varies according to the requirements of the job, but the basic principles of a heat sealed sachet remain constant. Materials vary from Pliofilm (rubber hydrochloride) laminated to metal foil, acetate and paper, foil and p.v.c. laminations to polythene coated paper. The latest pack is a sachet which can be sterilized at 150° C., and is used for surgical instruments and powders.

A similar service is offered by Technopol Laboratories Ltd., where many samples of high-frequency-welded p.v.c. tubes and sachets were on show.

Newcomers to the packaging field were Plastic Weldings Ltd., who have developed collapsible, double welded p.v.c. containers for the transport of liquids. The container is so designed as to fit inside a rigid board carton for transport.

The large number of plastics materials available to the packaging industry, particularly in the thermoplastic group, was the theme of the stand of B.X. Plastics, Ltd. Polystyrene, acetate, p.v.c. (rigid and flexible), polythene, all in film and sheet form and in addition a large selection of injection moulded, extrusion moulded, and vacuum formed containers provided ample testimony of the divergence of applications for which plastics are suited. Apart from this glittering display attention was being drawn to the ease by which the Cobex rigid vinyl sheet can be vacuum formed. On a single cavity vacuum forming machine, built in the B.X. laboratories, accurate reproductions of a metal wall plaque were being produced. The potentialities of this method of package forming have yet to be fully realized, but from the interest shown it will not be long before the impact is felt. Vacuum formed advertising displays were also on the stand of Goodman Leon Displays Ltd. Whilst on the subject of materials the wide range of p.v.c. sheet of different formulations, thicknesses and laminations should be mentioned. This was the subject of the stand of The Greenwich Leathercloth Co., Ltd.

Injection-moulded display caskets and containers in 37 stock shapes and sizes were the display of Progressive Inventions, Ltd., attractively designed they have the additional advantages of quick delivery and low cost.

Nylon wrappings which can be sterilized were included amongst the polythene and p.v.c. film, on the Anglo-American Plastics stand.

Microcell, Ltd., showed moulded containers made from glass fibre/resin laminates designed and developed for the transport and storage of fragile stores.

Nylon mesh screens for silk screen printing or decorating of packages or products were displayed by E. A. Kuffall-Dubuit Machines (London).

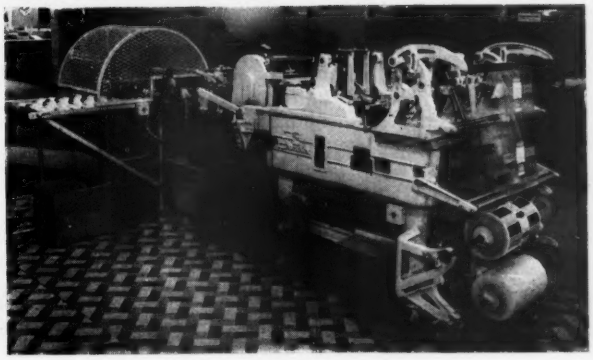
New machinery for handling plastics wrapping materials at improved packing speeds confirm the increased use of plastics materials in packaging. One of these machines, the Hansella Transwrap, a German machine, being sold by Bramigk and Co., Ltd., has an output of between 30 and 60 completed packages per minute which can be doubled for smaller bags. It can handle solids, granules, powders, pastes and liquids and forms the bag from the reel in polythene, p.v.c., Saran or Pliofilm. A demonstration of bag making from sheet polythene was held on the stand of Charles E. Douglas and Co., Ltd. The final product, a gusseted bag sealed down the back and across the base with two holes punched in the top, were coming off at speeds of up to 70 per minute. Adjustments can produce flat bags and radius seals. A remarkable machine! Other machinery included the Boehlen thermo-creaser for acetate boxes and a bag-opening machine. There were also samples of Nicolle pack in cellulose acetate and p.v.c.

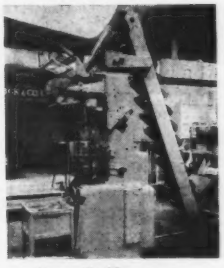
A. H. Bland (Engineers), Ltd., included in their range of heat-sealing equipment the base sealer for polythene tubes and also a fully automatic bag sealer and trimmer and a solenoid controlled pedestal sealer.

From the Continent Machinery (Continental), Ltd., introduced a semi-automatic wrapping machine designed for heat sealing or glue sealing.

Bag making from sheet material on the Simplex machine.

Polythene tube sealing machine.





Hansella Transwrap machine.

Parkes and Pyroxylin

By M. SCHOFIELD, M.A., B.Sc., F.R.I.C.

1955 marks the centenary of Parkesine, the forerunner of Xylonite, discovered by Alexander Parkes. Generally regarded as one of the "fathers" of the plastics industry, Parkes' inventive genius covered a very wide field and we have pleasure in publishing the following appreciation by Mr. Schofield.

THE centenary of Parkesine, that precursor of celluloid or "Xylonite" which Alexander Parkes first patented in 1855, is worthy of commemoration if only because Parkes achieved neither perpetuation nor full recognition for his versatility as an inventor. In that year Parkes began his series of patents for plastic masses and for cloth-impregnating and waterproofing compositions involving nitrocellulose. Independently of Daniell Spill and John Wesley Wyatt, the Birmingham pioneer prepared his nitrocellulose plastics for "buttons, combs, knife handles, card cases, boxes and penholders," as he stated in a catalogue issued for international exhibitions.

Artist and Chemist

It was appropriate that Parkes, in his early years as an employee of the electroplating firm of Elkington, should have styled himself "artist" as well as "chemist." Always he looked forward to the finished article for everyday use, rather than being content to invent or compound new materials for manufacturing such articles.

He was very clearly not the first to foresee the use of plastic compositions for producing "an endless variety of effects." Schönbein, the Basle professor who taught at one time in an Epsom school, prepared nitrocellulose and described his product to Michael Faraday, this after nitrating paper and finding an increased toughness as a result. Though nothing came of Faraday introducing Schönbein's idea to the firm of John Dickinson, the plastic theme is well in evidence in that letter to Faraday in 1846: "I send you a specimen of transparent substance which I have prepared out of common paper. This matter is capable of being shaped into all sorts of things and forms, and I have made from it a number of beautiful vessels. The first perfect one I obtain is destined to be sent to the Mistress of the Royal Institution . . . and I shall ask the Lady mentioned to preserve it as a sort of scientific keepsake." Yet it was Parkes in Britain, and independently Hyatt in the United States, who took this theme to practical realization.

As an "artist" who electroplated flowers and even spiders' webs with silver, Parkes turned later to nitrocellulose, this after much experience with solvents when he prepared and used carbon disulphide in his waterproofing process which he sold to Macintosh. He had begun with vulcanized rubber and was led to plastics in using nitrocellulose for waterproofing sheets, linen, cloth, and paper in the 1855 patent, No. 2359. He specified guncotton dissolved in wood naphtha, suggested the use of "gums and resins" to form a mass "which will set transparent with it," and recognized the drawback of inflammability by experimenting with magnesium ammonium phosphate as fireproofing agent. In his basement laboratory

Alexander Parkes, born in Birmingham in 1814, died in London, 1890. He disclosed, in his patent Number 2675 published in 1864, the use of camphor in nitrocellulose plastics.

Parkes had also prepared sulphur chloride; hence he brought in this solvent as well as castor oil in his preparations of "elastic solids and adhesive compounds." Hyatt in contrast did not regard castor oil as an essential, though he was a tireless experimenter with heat and pressure. Parkes must be credited with the use of mixed solvents, and with using higher solvents when shrinking resulted with the lower-boiling type. Especially did he recognize the value of camphor as a plasticizer, both in a lecture to the Society of Arts and in later patents; telling how it "exercises an advantageous influence on the dissolved pyroxylin and renders it possible to make sheets and other articles with greater facility and with more uniform texture, while it controls the contractile properties of the dissolved pyroxylin. For this, camphor is used in varying proportions from two to 20 per cent."

A New Material

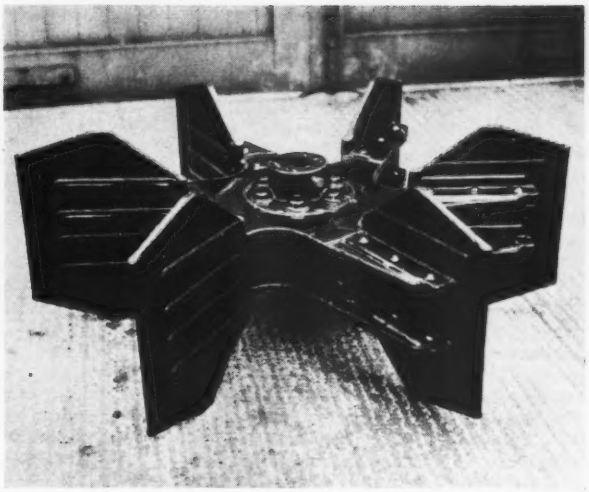
In an exhibition catalogue one may read how with Parkesine, invented before the time was ripe for a plastics industry, the Birmingham chemist foresaw the future. "A new material and manufacture now exhibited for the first time" the announcement begins. "For buttons, combs, knife handles, pierced and fretwork, etc. Can be made as hard as ivory, transparent or opaque, of any degree of flexibility, and waterproof. May be of most brilliant colours, can be used in solid, plastic or fluid state, worked in dies and pressure; may be cast or used as a coating; can be spread and worked similar to indiarubber, and can be exposed to the atmosphere for years without change or decomposition. Can be used in imitation of tortoiseshell and with endless variety of effects." By 1865 the material Parkesine was truly "celluloid," fully specified as rolled sheet prepared from nitrocellulose, wood naphtha, castor oil, camphor, dyes or pigments, and "forced into rods or tubes or moulded into articles." But always was his product bedevilled by inflammability, a drawback which led to the failure of the Parkesine Company.

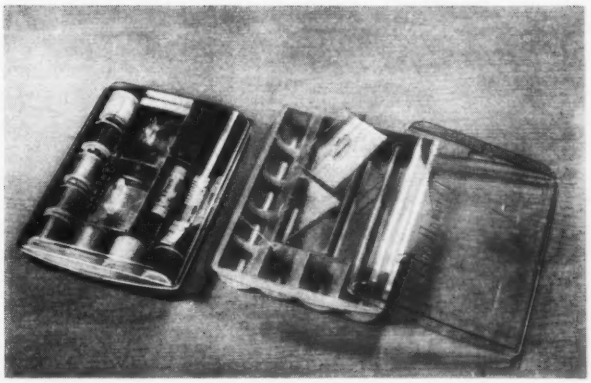
Not only with phosphate did he try to overcome this serious defect, but with experiments on fibre sheets produced from cellulose hydrate he sought to improve matters.

Parkes and Hyatt

Independently John Hyatt, a journeyman printer in the United States, somehow hit on camphor with a little alcohol as a plasticizer for celluloid. With his brother Isaiah this American inventor of gadgets was out to find a substitute for ivory, this after one of the largest billiard-ball makers of New York offered a 10,000-dollar prize since ivory supplies then depended on the depleted herds of wild elephants. With his compressed wood pulp, rag fibre, paper pulp and binders all failing, Hyatt turned to collodion and shellac before succeeding in preparing celluloid. Although Hyatt later produced special machinery for working plastics on a large scale, although the Celluloid Corporation of the United States in 1872-3 preceded by a few years the British Xylonite Company, the fact remains that Parkes was father of the industry in 1855. Although as first-rate metallurgist Parkes did achieve perpetuation in the Parkes' desilverizing process, he might well have won equal fame in plastics.

New Productions





(Above, left) Candelabra.

(Above, right) Thermoplastic fan impeller.

(Right) Needlework case.

(Below, left) Baby's bottle.

(Below, right) Developing tank.

Moulded Candelabra

A new light fitting, illustrated above, achieves a close resemblance to the elegant Louis Quinze candelabra in cream and gold. This new production has been moulded by Ranton and Co., Ltd., Commerce Road, Brentford, Middlesex. The material is polystyrene, manufactured by Kleestron, Ltd. The imitation candles have been left off to show the mounting of the bulb socket.

Baby's Bottle in Polythene

Graduated in fluid ounces, the baby's bottle illustrated has been produced in the Skylon range of polythene bottles by Fibrenyle, Ltd., 157 Dukes Road, Western Avenue, London, W.3.

Thermoplastic Fan Impeller

A Cobex/Velbex laminate has been used to protect this impeller, taken from a centrifugal fan. The laminated p.v.c. was heat-formed over the metal impeller and then completely welded, thus producing a liquid and gas proof coating.

Extreme care has to be taken with work of this kind, to guard against strain at the weld joints. Also, the balance of the impeller itself must not be disturbed. Cobex is unplasticized p.v.c. and Velbex plasticized p.v.c., both manufactured by B.X. Plastics. Ltd., Chingford, London, E.4.

Polystyrene Needlecraft Box

Manufactured by Stewart Plastics, Ltd., of 45 Morrish Road, Brixton Hill, London, S.W.2, the illustrated needlecraft box lid is injection moulded in clear polystyrene. Apart from the immediate sale appeal of this unit, it has the advantage that the user can at all times see the contents of the case and know when individual items are running short. The base is available in a range of attractive colours, including maroon, red, blue and light green, contrasting well with the clear lid.

Developing Tank in Polystyrene

The new Paterson Universal developing tank is moulded by British Artid Plastics, Ltd., using Distrene 100X black and crystal.

Celastoid used for crash helmet vizor.

Cigarette lighter display stand in urea.

Polystyrene has been chosen because not only is it resistant to photographic chemicals, but it has an excellent finish and the crystal material used for the reel enables the film to be observed during loading.

Moreover, the low weight of the material is important as the Paterson tank is exported throughout the world.

Thermoplastic Vizor for Racing Driver's Helmet

The crash helmet illustrated is being used on an increasing scale by many internationally famous racing motorists. An essential feature of the helmet is the vizor which must be able to withstand a wide variety of serious hazards, including stones thrown up by fast-moving cars, continual wind pressure, rain, and at the same time provide maximum protection to the driver in the event of an accident, and clear visibility. This crash helmet has been specially designed by Herbert Johnson, Ltd., of Bond Street, London, W.1, and the vizor has been fabricated from toughened, shatter-proof Celastoid sheet, manufactured by British Celanese, Ltd. This is a development of the already wide use of Celastoid sheet in industry where it is used for goggles, face shields and machine guards, being perfectly suited for work under difficult and often dangerous conditions.

Polystyrene Kitchen Bin

Our photograph shows a new production in the Bex range of household products, manufactured by Halex Ltd. The bin has been moulded in toughened polystyrene, two lifting handles being inlaid into the structure. The lid, moulded in the same material, also has a recess to act as a handle. At present it is available in ivory, green and red and measures 8½ in. by 8½ in. by 9½ in. deep. Among the advantages of this bin, which can also be used as a wastepaper basket without the lid, are lightness in weight, strength, and resistance to corrosion. This last-mentioned property is especially valuable where damp kitchen waste is involved.

(Above) Industrial bucket in polythene.

(Left) Refuse bin moulded in polystyrene.

Polythene Bucket

Injection moulded by Tool Treatments (Chemicals) Ltd., Colliery Road, West Bromwich, Staffs, the bucket illustrated has been specially designed for use by the chemical laundry, brewery, electro-plating and other industries. As will be seen a lip is moulded-in, together with a scale for measuring the contents. The capacity is two gallons and the handle is of steel covered with a p.v.c. shrunk-on sleeving. This bucket should meet with great success.

Display Counter

A Ronson display counter cabinet illustrated has been moulded for Ronson Products, Ltd., by Prestware, Ltd., Lombard Road, Merton, London, S.W.19. A compression moulding tool has been employed, the material being pastel urea of the Beetle range manufactured by British Industrial Plastics, Ltd.

New Polythene Colander

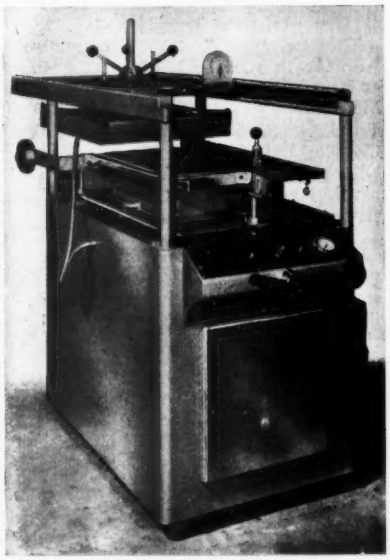
A new addition to the range of Ekco kitchen utensils is a lightweight colander, moulded in polythene by the Plastics Division of E. K. Cole, Ltd. Completely hygienic, it will withstand boiling water. The body diameter is 9 in. at the top and 8 in. at the bottom, and two horizontal handles provide a firm, easy grip.

(Right) New addition to the Ekco range of domestic ware; polythene colander.

Plastics NEWS

Raw Materials, New Plant, Works Organization, Control Apparatus, Research, Personal and Trade Notes

NEW VACUUM FORMING MACHINE.—The Latymer Engineering Company, 27A Charles Street, London, S.W.13, have recently introduced a standard range of vacuum-forming machines, an example of which is illustrated below. The designers have achieved a well-constructed machine based on sound engineering principles coupled with a pleasing appearance and a capacity which should be sufficient for the average user. The fabricated body stands on four feet and affords complete protection to the pump, motors and electrical gear which are accessible by means of doors at the side and at the rear end. Louvres in the end cover provide for air circulation within the body.



The Latymer single platen vacuum-forming machine.

The height of the heater can be varied by a single capstan-type handle, providing for quick and easy setting, and the heater carriage runs on special fibre rollers fitted with ball races. A blanket-type heater is used with a 3½-kW. loading, the heater area measuring 25 in. by 27 in. The clearance between heater and platen on the standard machine is 9½ in.

The clamping frame is easily adjustable to suit the size of moulding being used and the width of material, and is secured by a cam-action toggle clamp which may be varied in height and pressure. The frame is balanced by two weights which are easily adjustable.

The platen is of interest since it consists of a heavy well-ribbed aluminium casting, with a series of clamping holes at 2-in. intervals.

The pump normally fitted is an RB2 rotary-type pump manufactured by Lacy-Hulbert, Ltd., and driven by a ½ h.p. Gryphon motor built by Brook Motors, Ltd. The vacuum receiver consists of a galvanized cylinder 80 in. diameter by 30 in. long by ⅛ in. thick. Evacuation is controlled by two valves, the first of the quick-action type suitable for thinner material and the reproduction of intricate detail, and the second a slow-action valve for deeper drawing and heavier materials.

The control panel clearly seen in the illustration, carries pilot lamps for the heater and motor circuits, an on/off switch for the heater, push-button control for the motor and a chromium-plated vacuum gauge. The seconds timer is placed at eye level, on top of the heater carrier. The exterior of the machine is coated with a durable surface of silver-stoved enamel, hammer finish.

The overall dimensions of the machine are 2 ft. 6 in. by 5 ft. by 4 ft. high.

In addition to the standard series, machines of larger capacities can be constructed to order, the design of the basic machine being particularly suited to modifications of this kind. The standard series is being marketed at £340 ex works.

METAL INDUSTRIES, LTD., have acquired the whole issued share capital of Finney Presses, Ltd., Berkley Street, Birmingham, 1. The activities of Finney Presses will be co-ordinated with those of another member of the Metal Industries group of companies, Fawcett, Preston and Co., Ltd., thus widening the group's interest in the hydraulic field.

BRITISH INSTRUMENT INDUSTRIES EXHIBITION.—The Third Exhibition of this title will be held at Earls Court, from June 28 to July 9. Concurrently will be held the Tenth International Printing Machinery and Allied Trades Exhibition at Olympia.

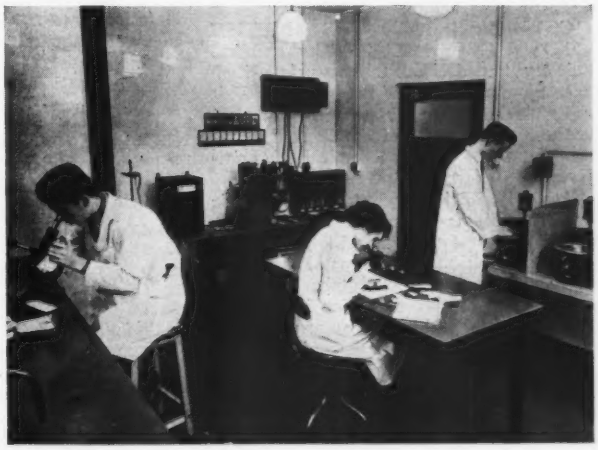
NEW SEALING IRON FOR THERMOPLASTICS.—We have received details of an electric sealing iron, supplied with either a plastic or wooden handle, suitable for sealing Cellophane. The iron is supplied with three wheels of various sizes. The manufacturers claim that it will also be suitable for welding p.v.c. and polythene.

For heavier gauges of sheet a knife edge sealing iron is also available. These tools are manufactured by The Acru Electric Tool Mfg. Co., Ltd., Chapel Street, Stockport Road, Levenshulme, Manchester, 19.

AIRMEC, LTD., of High Wycombe, Bucks, announce the introduction of a new temperature control unit, type N856, which has been designed for the accurate control of temperature of platens, ovens, etc., in the very wide range of −96° C. to 428° C. The sensitivity of the equipment is such that the relays operate and release on changes of the control resistance of 0.1%.

COMPOFLEX CO., LTD.—A most interesting exhibition organized by this company was shown at the Flexible Centre on Wednesday, January 19. The principal exhibits were flexible hoses designed to carry H.T.P. (high-test hydrogen peroxide). After intensive research carried out at the request of the Ministry of Supply the company have produced a range of thin-walled flexible hoses, all entirely compatible with H.T.P. which have been approved by various government departments. The introduction of this flexible hosing, facilitates the wide use of H.T.P. in such forms as a propellant oxidant for rocket engines, as an oxidizing agent in organic synthesis, as a polymerization catalyst in plastics and as an anti-pitting agent in electroplating. Much of the development work has been carried out by Mr. P. W. O'Brien who is in charge of the design and development (special projects) department of Compoflex Co., Ltd.

FIRTH BROWN TOOLS LTD.—The company's new research laboratories were opened on January 13th by Mr. Ibberson, the Master Cutler. One of the largest manufacturers of casting tools in this country, Firth Brown is a subsidiary of John Brown, the well-known marine engineers and shipbuilders. The new laboratories which have been built on the original site of John Brown, toolmaker, will be concerned in the research and testing in the field of powder metallurgy. There is an experimental machine shop to enable test specimens of hard metals to be prepared.



Metallographic laboratory at Firth Brown Tools, Ltd. Equipped for the examination of the microstructures of tool steels and hard metals, the laboratory is part of the company's new research centre.

"SIMPLE CUSTOM."—Readers may remember our note last year on the very elegant private edition of "Simple Heraldry" which was published by Thomas Nelson and Sons, Ltd., for Tullis Russell and Co., Ltd., Markinch, Fife, Scotland. So successful was that book that Tullis Russell have now distributed to their friends a volume entitled "Simple Custom." The production, needless to say, is excellent and the contents, compiled by Iain Moncreiffe of Easter Moncreiffe, O.St.J., M.A., LL.B., and Don Pottinger, M.A., D.A., are both witty and surprisingly informative.

ASLIB WINTER MEETINGS.—In pursuance of its policy to exploit to the fullest scientific and technological knowledge in the interests of greater productivity, ASLIB are arranging a series of lectures the first of which was given by Dr. Alexander King, Principal Scientific Officer of the Dept. of Scientific and Industrial Research. He described some of the trends of international information work which are having far-reaching effects on productivity in individual countries.

SYMPOSIUM ON REINFORCED PLASTICS.—Details have been received of the symposium which is to be held on February 17 at the College of Technology, Birmingham. The symposium will review methods of manufacture, properties and applications of structures based on glass and asbestos fibre impregnated with synthetic resins. The proceedings therefore should be particularly interesting to those investigating the use of these materials for structural and engineering purposes. The Chair will be taken by Dr. V. E. Yarsley and Dr. H. W. Keenan and the programme is given below.

"Polyester Resins; Their Constitution and Behaviour," L. H. Vaughan, Bakelite Ltd. "Fabrication Methods," R. A. Graydon, Saunders-Roe (Anglesey), Ltd. "Mechanical Application of Polyester Resins," J. R. Stevenson, British Industrial Plastics, Ltd. "Glass-filled Materials in the Aircraft Industry," N. Evans, Bristol Aeroplane Co., Ltd. "Asbestos and Its Use in Reinforced Plastics," L. A. R. Waring, Turner Brothers Asbestos Co., Ltd. "Properties of Glass Fibre Reinforced Structures," G. C. Hulbert, Scott Bader and Co., Ltd. "Glass-filled Materials in Boat Building," F. J. White, Consultant.

CHEMICALS AT THE BRITISH INDUSTRIES FAIR.—The chemical industry has decided to reassociate itself once more with the British Industries Fair in London. The decision to do so was taken at the recent meeting of the Council of the Association of British Chemical Manufacturers.

At the 1955 British Industries Fair a single exhibit will be staged representing the chemical industry. This will be followed in 1956 by full-scale participation in which individual companies will take part in a co-ordinated display of major importance. The 1955 stand will occupy an area of 1,600 sq. ft., on an island site in the main gangway of the Grand Hall, Olympia. Designed by Mr. John Lansdell, F.R.S.A., N.S.I.A., it will take, as its theme, the part played by the chemical industry in the life of the nation both at home and, by reason of its exports, overseas.

There will be an additional feature of special importance—a model of the comprehensive chemical section which it is intended to stage with the support of companies representing all branches of the industry at the British Industries Fair in 1956. The 1955 exhibit is, therefore, in the nature of a "holding operation" intended to support British Industries Fair, Ltd., in its initial venture and enable the industry to prepare itself for a publicity effort of major size in 1956.

PLASTICS INSTITUTE SIXTH ANNUAL LECTURE.—The sixth annual lecture of the Plastics Institute will be held on Tuesday, March 15 at 6.30 p.m. in the Main Hall of the Manchester College of Technology. The paper will be entitled "New kinds of Macromolecules," and will be presented by Professor H. W. Melville, F.R.S., Mason Professor and Head of Department of Chemistry in the University of Birmingham. Within the limits of his subject, Professor Melville hopes to make his paper of interest to non-academic members of the audience. Preceding the lecture, in the afternoon, the new plastics and rubber laboratories at Newton Heath Technical College will be open for inspection from 3 to 4.30 p.m. Tickets and further information can be obtained on application to the Plastics Institute, The Adelphi, Adam Street, London, W.C.2.

BRITISH PLASTICS CONVENTION, 1955.—To be held during the British Plastics Exhibition which opens on June 1, and closes on June 10, the Convention will comprise some 20 papers. Brief details are given herewith:—

Polymer Structure and Properties (1)

Thursday, June 2, 10.15 a.m., "The Synthesis of New Types of Addition Polymers," by H. W. Melville, F.R.S., Mason professor and Head of Department of Chemistry, University of Birmingham.

Polymer Structure and Properties (2)

Thursday, June 2, 2.30 p.m. "Some Properties of Irradiated Polymers," by A. Charlesby, D.Sc., F.Inst.P., Atomic Energy Research Establishment.

"The Molecular Weight of Polythene—Its Measurement and Significance," by S. W. Hawkins, B.A., Research Department, Imperial Chemical Industries, Ltd. (Alkali Division).

Expanded Plastics

Friday, June 3, 10.30 a.m. "The Chemistry of Modern Blowing Agents," by R. A. Reed, B.Sc., Ph.D., F.R.I.C., chief development chemist, Genatosan, Ltd., "The Technology and Uses of Polyurethane Foams," by L. N. Phillips, A.R.I.C., senior scientific officer, Royal Aircraft Establishment, Farnborough.

Thermoplastics

Friday, June 3, 2.30 p.m. "Dispersion of Polytetrafluorethylene," by H. M. Whitcut, B.A., Technical Service Department, Imperial Chemical Industries, Ltd. (Plastics Division). "New Nylon Polymers and Compositions," by R. H. Birtles, B.A., B.Sc., Technical Service Department, Imperial Chemical Industries, Ltd. (Plastics Division).

Extrusion

Monday, June 6, 10.30 a.m. "Fundamental Problems of Single-screw Thermoplastic Extruders," by E. Gaspar, M.I.Mech.E., chief designer, Projectile and Engineering Co., Ltd.

Works Study

Monday, June 6, 2.30 p.m. "Works Study in the Plastics Industry," by J. Grange Moore, M.A., Deputy Head of Central Works Study Department, Imperial Chemical Industries, Ltd. "Productivity and Methods in Moulding," by A. Sparshott, development engineer, Witton Moulded Insulation Works (The General Electric Co., Ltd.).

Injection Moulding (1)

Tuesday, June 7, 10.30 a.m. "The Effect of Injection Moulding Variables on the Quality of Mouldings," by K. C. Bryant, M.A., B.Sc. and G. Hulse, M.Sc., A.Inst.P., Monsanto Chemicals, Ltd.

Injection Moulding (2)

Tuesday, June 7, 2.30 p.m. "Recent Advances in Injection Moulding Techniques and in the Evaluation of Moulding Materials," by G. Campbell, B.Sc., A.R.I.C., Technical Service Department, Imperial Chemical Industries, Ltd. (Plastics Division). "Runners, Gates and Vents for Thermoplastic Moulds," by A. G. Elwell, technical service representative, B.I.P. Tools, Ltd.

Patents

Wednesday, June 8, 10.30 a.m. "British and International Patent Practice as it Relates to the Plastics Industry," by a chartered patent agent.

Foundry Resins

Wednesday, June 8, 2.30 p.m. "Recent Developments in the Use of Plastics in the Foundry," by P. G. Pentz, B.Sc., technical sales manager, Leicester, Lovell and Co., Ltd.

Glass Reinforced Plastics (1)

Thursday, June 9, 10.30 a.m. "Consistency in Glass Reinforced Moulding," by J. Rees, Superintendent, Plastics Department, Bristol Aeroplane Co., Ltd. "Glass Reinforced Plastics in Automobile Construction: Their Advantages and Limitations," by H. Silman, B.Sc., F.R.I.C., F.I.M., M.I.Chem.E., research engineer, Ford Motor Co., Ltd., Engineering Research Centre, Birmingham.

Glass Reinforced Plastics (2)

Thursday, June 9, 2.30 p.m. "Chemical Engineering Possibilities of Glass Reinforced Plastics with Special Reference to Polyester Resins," by V. Evans, M.Sc., F.R.I.C., A.P.I., special director and chief chemist, Prodorite Ltd., and J. R. Stevenson, B.Sc., A.R.I.C. A.M.I.F., Chemical development manager, British Industrial Plastics, Ltd. "The testing and Development of High Quality Glass Fibre Polyester Laminates," by P. H. H. Bishop, B.Sc., and E. Haythornthwaite, B.Sc., scientific officers, Royal Aircraft Establishment, Farnborough. "Epoxide Resin Glass Laminates," by W. J. Marmion, B.A., Plastics and Resins Department, Shell Chemicals, Ltd.

BRITISH INDUSTRIAL PLASTICS LTD., enjoyed a record year in 1954. A final dividend of 12½% was recommended which, on the existing £1.24m. share capital in 2s. shares, as increased by the 50% scrip issue last July, provides earnings of 37%.

I.C.I. BOARD CHANGES.—With effect from February 1, the following changes in directorial responsibilities on the board of Imperial Chemical Industries Ltd., will take place. Mr. C. Paine, appointed to development director; Mr. C. R. Pritchard appointed to joint overseas director; Mr. R. C. Todhunter appointed director in charge of Group E (paints and plastics) in place of Mr. P. C. Allen, who, as previously announced, has been appointed fibres director, Group F.

O.C.C.A. EXHIBITION.—I.C.I., Ltd., will be represented at the 7th technical exhibition of the Oil and Colour Chemists' Association, through three divisions, Dyestuffs, Nobel and Billingham. Amongst the items to be shown are Paralac 245, a polymeric plasticizer for use in alkyd-isocyanate coatings, and the second Paralac 9HW, a long oil drying, oil-modified alkyd resin.

FASTER FLOWING POLYSTYRENE.—Monsanto Plastics, Ltd., announce the introduction of Lustrex Hi-Flow 55, a faster flowing form of Lustrex polystyrene which can be moulded at lower temperatures and which is claimed to reduce cycle times by up to 15%. The material is specially suitable for intricate mouldings, particularly those needing a long flow.

POLYESTER DEVELOPMENTS IN AUSTRALIA.—Cable Makers Australia Proprietary Ltd., and S. A. Rubber Mills, Ltd., have jointly been appointed Australian manufacturers of elastic and rigid polyester foams under licence from Farbenfabriken Bayer A.G. Leverkusen, Germany. Materials of this kind were discussed in the article which appeared on pages 398 and 399 of the December, 1954 issue of *Plastics* under the heading "Applications of Foamed Polyurethane Resins."

RICHARD KLINGER LTD., Sidcup, Kent, held a luncheon on January 25 in connection with Klingdecor plastic-surfaced sheet.

HORNERS' DINNER.—The Master, Wardens and Court of Assistants were hosts to a large number of guests from the plastics industry at the annual plastics lecture and dinner of the Worshipful Company of Horners. The dinner was held at the Fishmonger's Hall, London Bridge, on January 21, and presided over by Mr. Charles L. Pinker, C.C., the Worshipful Master. The Fishmongers Hall formed a most elegant setting for the ritual of this ancient livery company, which has done so much for the plastics industry. Many members of our industry are, of course, liverymen of the Horners Company.

Mr. Peter Delafield delivered the annual lecture, taking as his theme "In Praise of P.V.C." During the course of his lecture he reviewed the progress which this remarkable material has made.

Mr. Derek Walker-Smith, M.P., replied on behalf of the guests and thanked the Company for the hospitality which had been extended to them. The Clerk of the Company, Mr. Thomas F. Clarke, spoke only briefly, making way for the Beadle, Mr. W. A. Bourdon, who retires on February 2, after 64 years with a well-known firm of City solicitors. He will continue, however, as Beadle. The short speech which he gave did more, perhaps, than anything else to remind his listeners of the real tradition of service which the Company has maintained down the years.

During the evening the Worshipful Master presented the Horners Award for 1954 to Mr. David Powell, a member of the Product Design Unit of British Industrial Plastics Ltd.

PLASTICS INSTITUTE DANCE.—The annual dance of the London Section of the Plastics Institute was held at the Monico Restaurant, London, W.1, on Friday, January 14. Over 270 members, wives and guests contributed to make this evening one of the most successful Institute dances yet held. Generous contributions by a number of companies in the industry made it possible to organize a handsome draw on ticket numbers, and prizes were also presented during a number of dances. The ladies were presented with a handsome p.v.c. shopping bucket. Mr. Peter Brown, chairman of the London Section, presided over the proceedings, and Dr. Eric Hunt ensured a very happy evening for the London Section members in his capacity as M.C.

"Plastics in the Service of Man"

The following is a list of full names and addresses of companies mentioned in the illustrated feature, "Plastics in the Service of Man," which appears on pages 44 to 47 in this issue:—

54. The Fighting Services—1

Aerialite, Ltd., Castle Works, Stalybridge, Cheshire.
Aeroplastics, Ltd., North Hyde Road, Hayes, Middlesex.
Auster Aircraft, Ltd., Rearsby Aerodrome, Rearsby, Leicester.
Avro—A. V. Roe and Co., Ltd., Greengate, Middleton, Manchester.
B.X. Plastics, Ltd., Higham's Park, London, E.4.
Bakelite, Ltd., 12 Grosvenor Gardens, London, S.W.1.
Bristol Aeroplane Co., Ltd., Filton House, Bristol.
British Moulded Plastics, Ltd., Walthamstow Avenue, London, E.4.
British Ropes, Ltd., Plastics Dept., Leith, Edinburgh, 6.
Chloride Batteries, Ltd., Clifton Junction, Swinton, Manchester.
Cobex—see B.X. Plastics, Ltd.
Durestos—see Turner Brothers Asbestos Co., Ltd.
Export Packing Service, Ltd., 56 Kingsway, London, W.C.2.
Fairey Aviation Co., Ltd., Hayes, Middlesex.
Gloster Aircraft Co., Ltd., Gloucester.
Halmatic Ltd., Rodney Road, Portsmouth.
Hawker Aircraft, Ltd., Canbury Park Road, Kingston, Surrey.
Isoflex—see B.X. Plastics, Ltd.
Kelvin and Hughes (Industrial), Ltd., 2 Caxton Street, London, S.W.1.
London Nameplate Manufacturing Co., Ltd., Zylo Works, Brighton, 7.
McMurdo Instrument Co., Ltd., Victoria Works, Ashtead, Surrey.
Norvent, Ltd., Westgate Road, Newcastle on Tyne.
Perspex—I.C.I., Ltd., Plastics Division, Welwyn Garden City, Hertfordshire.
Short Bros. and Harland, Ltd., Queens Island, Belfast.
W. and J. Tod, Ltd., Ferrybridge, Weymouth.
Tufnol, Ltd., Perry Barr, Birmingham, 22B.
Turner Bros. Asbestos Co., Ltd., Rochdale.
Velbex—see B.X. Plastics, Ltd.
Westland Aircraft, Ltd., Yeovil, Somerset.

MEETINGS

February

14th.—"Recent Developments in Mould Making Techniques," D. Preston and A. D. P. Tallents. Plastics Institute, London Section, Waldorf Hotel, Aldwych, London, W.C.2. 6.30 p.m.

16th.—"Mechanism of the Thermal Breakdown of Linear Polyesters and Related Polymers," Professor P. D. Ritchie, B.Sc., Ph.D., F.R.I.C., F.R.S.E. Plastics Institute, North-Eastern Section, Oak Room of Mining Institute, Neville Hall, Newcastle upon Tyne. 7.0 p.m.

16th.—"Plastics in Lighting Fittings," P. H. Collins. Plastics Institute, Scottish Section, Institute of Engineers and Shipbuilders in Scotland, 39 Elmbank Street, Glasgow. 7.30 p.m.

18th.—"P.T.F.E.," E. M. Elliott, A.M.I.Prod.E. Plastics Institute, Midlands Section, James Watt Institute, Great Charles Street, Birmingham. 6.30 p.m.

23rd.—"Financial Management through Standard Costing and Budgetary Control," J. Oldham. Plastics Institute, Western Section, The Wheatstone Hall, Gloucester. 6.30 p.m.

25th.—"Rigid P.V.C. Development," L. H. P. Weldon, B.Sc., Ph.D. Plastics Institute, North-Western Section, Engineers Club, Albert Square, Manchester, 2. 6.30 p.m.

March

1st.—"The Chemistry of the Polymerization of Caprolactam," Dr. P. Hermans. Society of Chemical Industry, Plastics and Polymer Group, Rooms of the Chemical Society, Burlington House, Piccadilly, London, W.1. 6.30 p.m.

2nd.—"Patents for Inventions," J. W. Crump. Plastics Institute, Midlands Section, Bell Hotel, Leicester. 6.45 p.m.

8th.—"Changes in Some Physical Properties of Rubber-like Materials Produced by Irradiation," A. Charlesby, F.Inst.P., B.Sc., Ph.D., A.R.C.S., D.I.C. Plastics Institute, London Section. Joint meeting with the London Section of the Institution of the Rubber Industry.

9th.—Film Show. Plastics Institute, South Wales and Monmouthshire Section, Cardiff Technical College. 7.0 p.m.

TALKING SHOP . . .

Plastics for Service Packaging. Mr. D. J. Evans read a very interesting paper on this subject to the London Section of the Plastics Institute on January 10. Particularly to those who have not previously encountered this field of activity, the special problems that arise with packaging equipment for the Armed Forces are complex indeed, especially, as Mr. Evans pointed out, as the failure of a package might well endanger the lives of Servicemen. This point he made in answer to a questioner who seemed to be puzzled by the very high cost in certain instances of certain service packings in relation to the cost of the component being packed.

Talking to Mr. Evans after the lecture I heard of an interesting problem involving the use of polythene which came up for discussion a short while ago. Sulphuric acid, required for batteries, in naval vessels, was customarily delivered to the quayside in carboys, decanted into Winchester flasks and taken out to the vessel by means of lighters. The Winchesters were then manhandled up the sides of the vessel and stored within the ship. The acid, at full concentration, was, of course, a most dangerous commodity to move in this way and at least two very serious accidents resulted from a Winchester being broken when being moved from the lighter into the ship. Polythene is now used in place of the glass Winchesters, reducing the risk very substantially and also easing the problem of storage within the vessel itself.

* * *

Safety in Mines. Her Majesty's Stationery Office recently published the 32nd Annual Report on Safety in Mines Research, summarizing the work done in 1953 by the Safety in Mines Research Establishment. The report notes the commendable performance of p.v.c.-coated cloths used as screens in pits to reduce fire hazard.

* * *

Challenge of German Competition. A special correspondent of *The Times* in Stockholm reported, in the issue of January 10, British trade success in the Swedish market. According to Swedish official records, Sweden imported about £83m. of raw material and manufactured goods from Britain in the first 10 months of 1954, making Sweden an extremely valuable customer of Britain. The pattern of Swedish trade has changed greatly since 1930 when coal was the basic British export. The demand for coal has lessened as the country has turned to oil fuel but this, of course, has been balanced by exports of other commodities, a field in which our plastics industry has played a part.

The export from Britain to Sweden of plastics moulding powders reached a new record level in 1954. Whether this can be maintained in this current year may depend on the extent of competition from the United States and from Germany. It is certain that the latter will be persistent.

Harrogate Toy Fair. The Fair, which opened on January 8, was remarkable if only because 25% of all the toys on display were fabricated from plastics materials, this compared with 15% four years ago. A notable trend was the wide use of polythene in toys; I.C.I. Ltd., have now perfected the colouring technique so that polythene moulding powder is available in a very wide range of colours, and have also evolved a technique for imparting a high gloss to the mouldings, effected by running the tool hot, instead of, as in normal procedure, cold.

Another trend which emerged from the Fair was the move towards more "peaceful" toys. Apparently children are not quite so interested as they were in scale-model atomic weapons and the like. This trend was also noticeable in "Plastics in the Service of Man" for November and December last year, which was devoted to toys and games.

In the *Financial Times* for January 10, an estimate was made of £646,000 worth of plastics toys, excluding dolls, having been exported in 1954, compared with £500,000 in 1953, and £400,000 in 1952.

The overall figures for the manufacturer's sales of toys totalled approximately £19m. Of these toys made from plastics materials accounted for £4½m.

Although one could expect only the best to be shown at Harrogate, nevertheless, the quality of plastics toys was universally excellent and was an eloquent tribute to the toy designers who have so readily taken advantage of the many excellent properties afforded by plastics in this field.

* * *

Powdered Steel and Plastics. An apparently new material was briefly described in the January 10 issue of the *Financial Times*. Attracting a good deal of attention at the recent National Exposition of Power and Mechanical Engineering in Philadelphia, the material is stated to be 80% powdered steel and 20% plastics (type unnamed) and is manufactured by the Chemical Development Corporation, of Danvers, Massachusetts. The manufacturers say it will cement together parts of steel, aluminium, bronze, brass, cast iron and porcelain and is transformed from its original pliable-like state by the addition of a small hardening agent. No heat or pressure is needed to cause hardening.

The use of a hardener would suggest that the basic resin belongs to the polyester group since these compounds can be set quickly without the evolution of water. The product has been used in forming dies. making small drill and other machining fixtures, filling holes in castings and building up metal parts.

In some respects it seems to resemble the "Filzall" filling compound manufactured in this country by Birmetals, Ltd. Here a thermoplastic is used as a basis for a finely divided metal powder, the whole being softened by heating. The use of a thermosetting compound would, however, widen the field of application considerably with the production of the compound having greatly superior heat resistance.

* * *

Research in India. We recently received a copy of a survey of research problems in plastics published by the Council of Scientific and Industrial Research, New Delhi. Comprising over 150 pages, the report is remarkably comprehensive. Amongst the fields covered are fundamental research, including free radical initiation, natural resins, naturally occurring polymers, particularly of the cellulose family, polycondensation products, including polymers from unstable ring systems, and processing of plastics. From this report it is quite evident that the plastics research committee of the C.S.I.R. is taking full advantage of developments in Britain, America and elsewhere and is also initiating fundamental research not necessarily being carried out elsewhere.

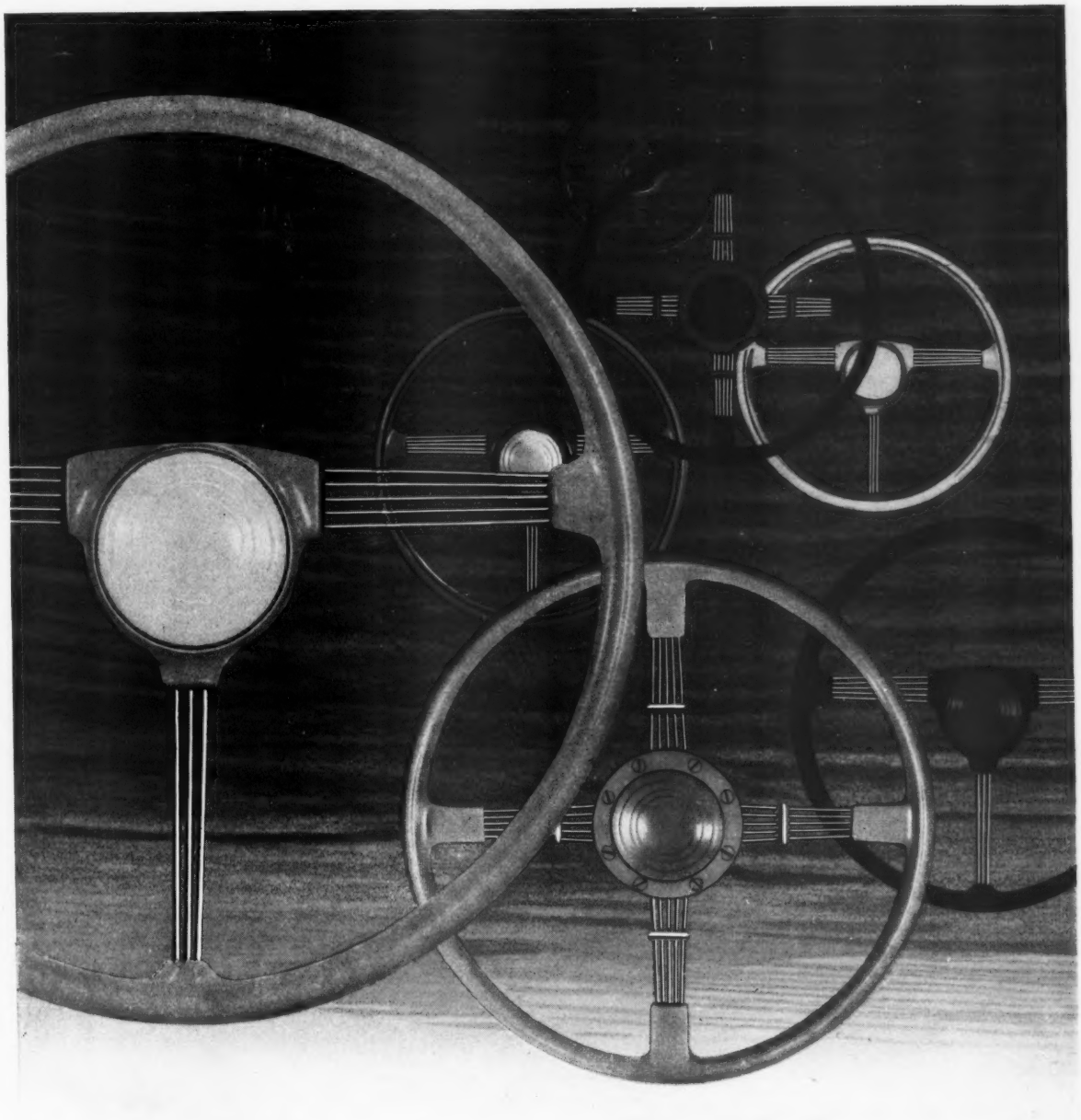
* * *

Life Boats in Glass Fibre. The Dutch Government's Inspector-General of Shipping is reported to have approved the use of Dutch-built polyester/glass fibre life boats. Developed by a company in Ijmuiden, Mulder and Rijke, N.V., the boats are designed on strictly conventional lines and are claimed to be greatly superior in strength and weathering properties to the wooden counterpart. The company expects substantial export orders.

* * *

Careers for Young People. Many of us may not be aware of the work that is being done in guiding young people in a choice of careers. Most schools today have a careers master whose special task it is to maintain an up-to-date record of opportunities for young people in the professions, commerce and industry. Youth employment officers are also at work in all districts and again are specially briefed with current information. One of the most effective aids to the careers master, the youth employment officer and to the young person seeking advice is the series of booklets prepared by the Ministry of Labour and National Service and the Central Office of Information and published by Her Majesty's Stationery Office. One of the latest has just come into my hands, entitled "Engineering Draughtsman"; this booklet would make absorbing reading even to the layman. The frontispiece is a reproduction from a sixteenth-century treatise on mining engineering, perhaps one of the earliest machine drawings in existence. A two-page spread in the centre shows in detail the main "motion" of a modern railway passenger locomotive, the original drawing being 7 ft. long and 3 ft. deep. The information that is given includes an historical review, details of the importance of engineering drawing in industry and specific information as to the various branches of engineering draughtsmanship, including jig and tool work, shipbuilding, etc., and much useful advice as to facilities for training. These booklets should in time prove very valuable to all concerned with careers for young people.

PLASTIKON.



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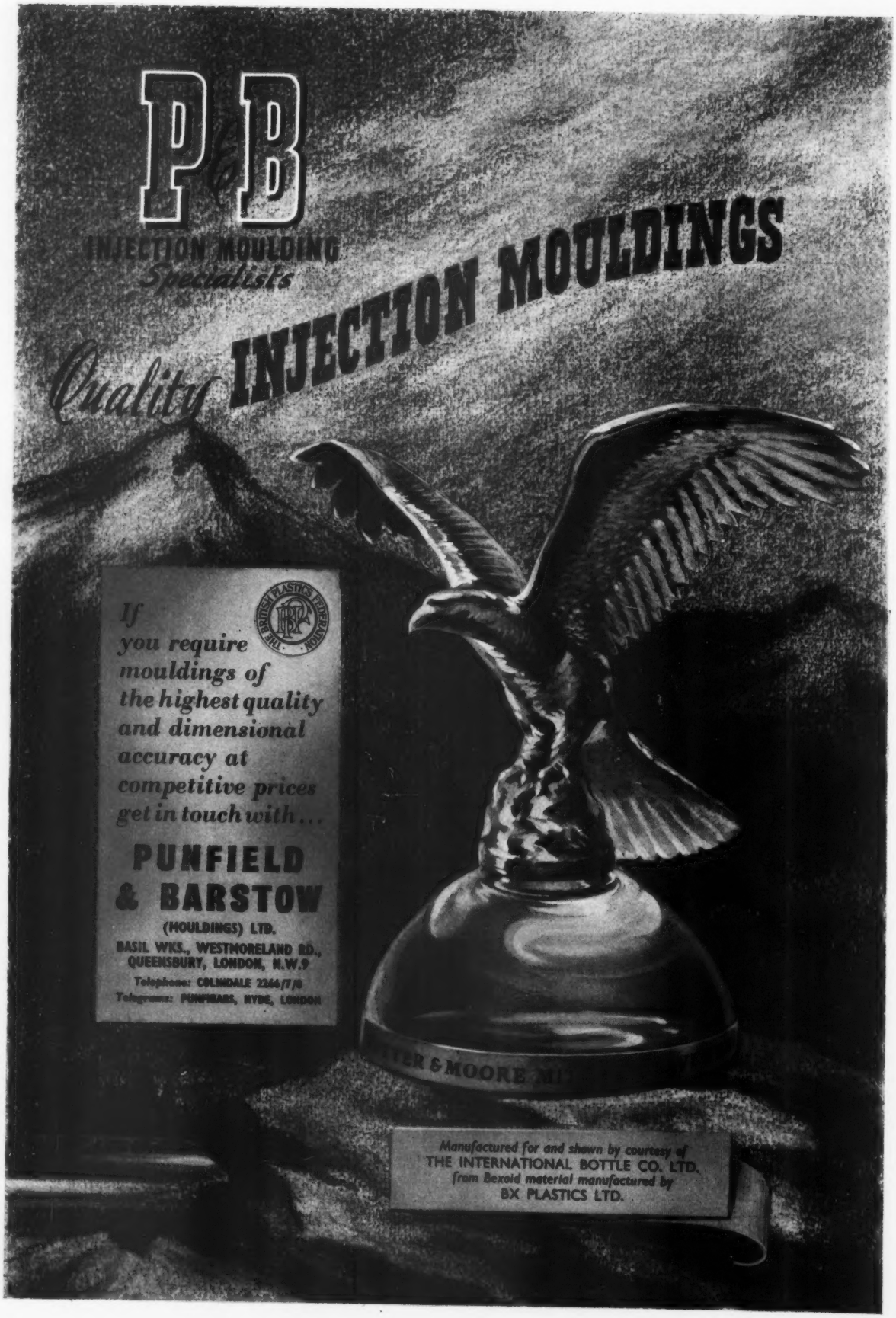
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PATENT REVIEW

The following abstracts have been made from specifications at the Patent Office, with the permission of the Controller of H.M. Stationery Office. The country of origin for Convention Applications is shown in parentheses. Complete specifications can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, price 2s. 8d. each (including postage).

B.P. 719,752. Hypodermic syringe. To: Abbott Laboratories (U.S.A.).

Composed of three main parts, barrel, sealing cap, piston-plunger, all made of polyethylene.

B.P. 719,756. Solid polymer compositions. To: Mathieson Chemical Corp. (U.S.A.).

Polystyrene and 1% to 25% benzene hexachloride.

B.P. 719,779. Provision of metallic films on plastic bases. R. J Heritage. To: National Research Development Corp.

In the resistor and electrical condenser manufacture. The final product is a thin film of plastic material carrying the metallic film.

B.P. 719,797. Anti-glare screen for the driving mirrors of road vehicles. V. S. Sullivan.

A coloured transparent (plastic) panel is clipped to the mirror.

B.P. 719,861. Circular hand knitting needle. O. A. Winter, H. Winter (Germany).

A pair of knitting pins is interconnected by a filament of a tough, solid polycondensation product (polyamide) with enlargements near its ends. These ends are received in bores in the knitting pins. The pins may also be of plastic material (polyvinvyl chloride).

B.P. 719,868. Method of making sponge material and resulting product. C. L. Wilson (U.S.A.).

An expanded reaction production of polyvinyl alcohol, formaldehyde and an organic nitrogen compound. The mixture is more resistant to detergents.

B.P. 719,871. Seam welding of heat sealable sheet materials with high frequency electric currents. H. Alexander.

A carrier is used which becomes adhesive during welding, so that the portions to be sealed can pass on this carrier between roller electrodes through the welding machine without changing their position.

B.P. 719,907. Method and apparatus for joining fabrics of synthetic thermoplastic materials. S. S. L. Bernard (France).

The edges of the fabric are welded and sewn simultaneously. Superpolyamides are mentioned.

B.P. 719,941. Inter-fitting members. General Electric Co., Ltd., W. Harrison.

A Christmas-tree lamp shade assembly made from "Scarab."

B.P. 719,964. Method of and apparatus for continuously impressing foils, webs or sheets of synthetic thermoplastic material. H. Hiedemann (Germany).

The foil, web, sheet is hung free of tension vertically over or below the gap formed by a pair of impressing rollers. Radiant heat is supplied while the foil, etc., passes through the gap.

B.P. 719,983. Sliding clasp fastener. S. G. Hagelторn (Sweden).

Locking members are formed in a carrier band of nylon or other similar plastic materials. The carrier band is provided with an abutment beyond which the material to which it is to be attached cannot extend.

B.P. 720,017. Belting. D. R. Henson. To: Dunlop Rubber Co., Ltd.

A conveyor belt of tubular flexible elements made from nylon or "Terylene" embedded in a covering layer, e.g., of polyvinyl chloride (or rubber or balata).

B.P. 720,023. Production of anti-static synthetic-resin compositions. R. G. Rowe, G. Flower, Jr. To: Dictaphone Corp. (U.S.A.).

Vinyl resins used in the production of phonograph records can be made anti-static by incorporating minor amounts of a monoamide of a straight-chain hydroxy acid. This prevents the accumulation of dust on long-playing records.

B.P. 720,035. Production of hardenable resins. To: Badische Anilin-und Soda-Fabrik (I.G. Farbenindustrie A.G.) (Germany).

Phenol formaldehyde resins prepared with hydrocarbons.

B.P. 720,046. Method of making sand-resin moulds. D. J. Henry. To: General Motors Corp. (U.S.A.).

B.P. 720,092. Surgical device. J. T. Scales. To: National Research Development Corp.

Made from a polyamide resin for insertion in articulated joints as a cup-like member.

B.P. 720,108. Apparatus for moulding sheets of thermoplastic material into dished or other non-planar shape. C. L. Smith, I. L. Yarrow. To: E. S. and A. Robinson, Ltd.

Suction is applied to that part of the periphery of the die which co-operates with the pressure head to clamp the sheet therebetween. The apparatus includes heating means and may be provided with electric switches for automatic operation.

B.P. 720,109. Device for winding and holding wool and other thread for domestic purposes. A. E. Isted.

A split tube with end collars on a spindle with two spaced flanges inside the tube.

B.P. 720,125. Process for the manufacture of industrial carbon bodies from pit coal. To: Siemens-Planiawerke A.G. für Kohlefabrikate (Germany).

Electrodes, current collectors, tubes and linings for the chemical industry are made from finely divided pit coal mixed with a phenol resin, shaped in a press, then heat treated in a protective gas, in which the coal and the synthetic resin are coked.

B.P. 720,133. Adjustable bracket supports for display and other purposes. C. W. Hobson. To: N. Stephenson.

The brackets are slidable in channels of supporting members or the brackets may grip ribs on these members where they are adjusted by pins or an arrangement of projections and recesses.

B.P. 720,140. Shinguards. W. A. George.

Made of a rigid polyvinyl chloride or a thermosetting plastic sheet material or of resin-impregnated glass fibre in two parts, one shaped to fit the leg, enclosing an intermediate shock-resistant layer of "Dufaylite" (honeycomb paper mesh bonded with synthetic resin).

B.P. 720,145. Pressure casting of polyamides or like thermoplastic materials with a short softening zone. To: N.V. Onderzoekings-instituut Research (Netherlands).

Long objects are cast in two-part mould, one of which is short serving as end cover screwed onto the main part into which the material is filled. The screw threads are arranged on an enlargement around the mould with apertures to connect the enclosed space over the thread with the atmosphere so that no material penetrates between the screw connections. The casting is removed by screwing off the cover part and pulling on the then projecting part of the casting.

B.P. 720,171. Indicator lights. H. S. B. Meakin, Ltd., H. S. B. Meakin.

Flush-fitting lights for use on control panels (aircraft, vehicles, industry) are made with two adjustable light-polarizing screens to permit varying the light intensity. The light is emitted from a projecting translucent end plug.

B.P. 720,211. Valves. J. F. Duncan, D. T. Warren. To: National Research Development Corp.

The material of conduit valve chamber and valve base and also other parts (e.g., a disc between diaphragm and conduit) is polythene, while a steel spring is coated with polythene so that the valve is suitable for use with hydrofluoric gas.

B.P. 720,226. Improvements relating to teeth. F. C. Hunt, W. G. Hudson.

A protector worn over teeth made of a thin sheath of pliable transparent material produced from fine-grain plastic powder. The protector may be used for the teeth of animals as well (valuable race horses, dogs).

B.P. 720,230. Process of and apparatus for the continuous production and treatment of flat structures of or containing plastic materials. To: Dynamit A.G. vorm. Alfred Nobel and Co. (Germany).

Foils and plates of polymerization products are polished between two endless metal bands by pressure of a liquid or gaseous medium which may be heated to the softening or hardening temperature. Cooling may take place without pressure.

B.P. 720,249. Printing surfaces for duplicating texts. W. Ritzerfeld, G. Ritzerfeld (Germany).

For the master sheet portion that needs inking, a stencil made of combinations of polyvinyl chlorides may be used.

B.P. 720,254. Electric plug. X. Schuler (Switzerland).

B.P. 720,255. Venoclysis equipment. To: Abbott Laboratories (U.S.A.).

A length of protective tubing of hard thermoplastic material is used together with a deformable tube of metal.

B.P. 720,270. Mouldable compositions. J. H. Bennitt, T. S. Simpson. To: Bakelite, Ltd.

Nylon filaments, yarns or cuttings are incorporated as fillers in a thermosetting polyester resin. Such compositions show great resistance to the yellowing influence of light, can be heated to high temperatures, are free from odour and have less tendency

than previous compositions to crack around metallic inserts.

B.P. 720,274. Sizing of nylon tubes or rods. R. E. James, Jr., R. B. Koch. To: Polymer Corp. (U.S.A.).

The rod or tube stock passes through a reducing die after it has been heated in advance of the die; it is chilled as it leaves the exit side of the die. The die passage is larger than the size of the stock when completely oriented.

B.P. 720,291. Composition brake blocks. C. L. E. de Gaugue, Jr. To: Johns-Manville Corp. (U.S.A.).

The moulded composition contains a substantial amount of thermosetting phenolic-aldehyde resin stiffener.

B.P. 720,309. Method of producing compound hollow bodies. To: Vereinigte Deutsche Metallwerke A.G. (Germany).

A hollow metal body is slid over a hollow body of thermoplastic material and the two bodies then joined together by pressing. Compound tubes may be made to fit by subjecting the tubes to a drawing operation. The synthetic tube may be treated with a solvent before it is sheathed or an adhesive may be provided as a binding agent. A heat treatment may follow. The metal body may also be extruded around a finished plastic body.

B.P. 720,377. Sliding fasteners. L. Steiner (Australia).

The engagement occurs by interlocking the resilient two edges lengthwise by a slider consisting of a hollow frame member mounted on the first edge with a guide gripping the second edge inserting or freeing a compensating member which may be made in sections. The bar-like edge elements are particularly suitable to be made (extruded) from flexible plastic material.

B.P. 720,392. Lettering film unit. To: Minnesota Mining and Mfg. Co. (U.S.A.).

A composite product cut into sheets and arranged in stacks to be cut into letters by punching, sawing, etc., is made from a decorative weather-resistant film with a normally non-tacky adhesive layer permanently bonded to one surface of the film while a carrier sheet is temporarily stuck to the other surface. The surface opposite the surface temporarily adhered to the decorative film may be a continuous polythene film, the surface temporarily stuck to the decorative film a methacrylate polymer film or a plasticized amino-aldehyde resin film, the decorative film an air-drying alkyd resin.

B.P. 720,395. Splints for surgical purposes and method of producing the same. B. Polovtseff. To: Airscrew Co. and Jicwood Ltd.

A core moulded to shape from wax is covered with windings of glass fabric impregnated with synthetic resin. The core is removed after hardening of the cover.

B.P. 720,496. Shoes. R. J. Marcy (U.S.A.).

A polyethylene counter is incorporated in a shoe.

B.P. 720,506. Interpolymers. To: B. F. Goodrich Co. (U.S.A.).

Sheets, films, coatings by polymerization of three types of monomers, a vinyl chloride, an alkyl acrylate, an ester containing a vinyl group and a free carboxyl group.

B.P. 720,512. Ankle and knee supports for personal wear and for artificial limbs. J. Guest.

Of particular advantage for dropped-foot appliances. A moulded casing may be made from a thermosetting plastic.

B.P. 720,514. Electric capacitor. Tzu En Shen, K. W. Plessner. To: British Electric Research, Ltd.

Two capacitors embedded in a single body of "Araldite."

B.P. 720,516. Making films and fibres from normally crystalline polymer lattices. To: Dow Chemical Co. (U.S.A.).

B.P. 720,539. Electrically conducting laminated safety glass. To: Libbey-Owens-Ford Glass Co. (U.S.A.).

Bending under heating loads (aircraft) can be practically eliminated by positioning the electrically conducting film in a special location relative to the faces of the glass and plastic.

B.P. 720,546. Spectacles. F. F. W. Griffith. To: Bentley Ltd.

Relates to the appearance of a (plastic) brow bar.

B.P. 720,555. Electrical insulating material in sheet form analogous to paper. R. S. Vincent, R. West. To: British Dielectric Research, Ltd.

A mixture of cellulose fibres and small particles of polystyrene.

B.P. 720,566. Heat resistant moulding composition and moulded article. To: Atlas Powder Co. (U.S.A.).

A resin and a filler. The resin is composed of a high-melting polyester of fomaric acid and a diol, an ester of a dibasic acid and an alcohol, a vinyl polymerization catalyst.

B.P. 720,581. Manufacture of sacks or bags of paper, transparent thin film, or like material. R. Scheer. To: Ateliers de Constructions Mécaniques C. and A. Holweg S.à.r.l.

In particular for "Cellophane" bags, which easily tear at cuts during manufacture and then have to be discarded.

B.P. 720,585. Hair curler. W. A. Whysall. To: Newey Brothers, Ltd.

The body is made from polyvinyl chloride

B.P. 720,595. Safety razor blade holders. W. Lewis, J. C. Tannock.

With receptacle for a protecting substance and with wiping strips.

B.P. 720,601. Optical instrument. L. Morris, M. C. Suliman.

A multi-purpose instrument with a central bar and two lens holders pivotable on hinges on either end to obtain an open opera glass or a magnifying glass, stereoscope, etc. Bar and lens holders may be made from a resin of the polyacrylic or polystyrene type.

B.P. 720,629. Bed-pans. J. Guest.

A narrow open-topped extension on the main receiver.

B.P. 720,652. Container-dispensers. To: Unicura N.V. (Netherlands; Germany).

A polyethylene ampoule with a hypodermic needle and a thermoplastic protective cover.

B.P. 720,656. Shirt collar supports. B. Fairbarns. To: John Desmond and Co., Ltd.

A pair of V-shaped supports formed integrally with means for attachment to a displayed soft collar as a bow tie so as to minimize risk of loss before use.

B.P. 720,669. Crochet-hook. G. A. Carlson. To: Boye Needle Co.

B.P. 720,687. Manufacture of helmets and like hollow articles. Helmets, Ltd., L. R. Noblett.

A number of knitted shapes superposed on a forming block, successively coated with thermosetting resin, heated to render the article so far formed sufficiently rigid to be removed, then moulded under heat and pressure.

B.P. 720,688. Method of moulding decorative and other designs or articles of plastic material. W. W. Browning.

A thin metal sheet is pressed into an intaglio mould, coloured liquified plastic material applied (painted) to the sheet to make up the article to the depth of the impression, then still on the sheet solidified by heat, stripped off after cooling.

B.P. 720,703. Printing plate material. To: United States Rubber Co. (U.S.A.).

A backing layer of soft-vulcanizable rubber adhered to a facing of a thermosetting (phenolic) resin.

B.P. 720,710. Ash-trays. S. Schreiber.

A bowl with a grooved bridge as cigarette rest.

B.P. 720,742. Extrusion machines. To: Hugo Stinnes Verwaltung G.m.b.H. (Germany).

The plastic material tends to slip tangentially along the extrusion worm and the cylinder surrounding it. Tangential grooves have already improved the effect of the worm. By completely dispensing with grooves in the region of the filling zone (opposite the filling hole) and enlarging the diameters of worm and cylinder in this zone all difficulties have been overcome.

B.P. 720,743. Extrusion machines. To: Hugo Stinnes Verwaltung G.m.b.H. (Germany).

Two feed worms mounted concentrically in cylinders one inside the other for delivering different substances to the nozzle. The outer worm is also provided with an inner thread which through apertures is in connection with the outer surface and also conveys material to the extrusion nozzle.

B.P. 720,804. Dispensers, containers, or receptacles, particularly mustard dispensers. C. Krebs, Gerdes and Co. A.G. (Germany).

A single spring for the step-by-step (ratchet and pawl) movement and the actuating lever. Piston of polyethylene.

B.P. 720,813. Sealing device for bottles and the like. G. Livas (France).

A cylindrical flanged insert (plastic) integral with a hollow stopper resiliently attached to it on one side so as to open the bottle by pulling the stopper without removing it from the insert.

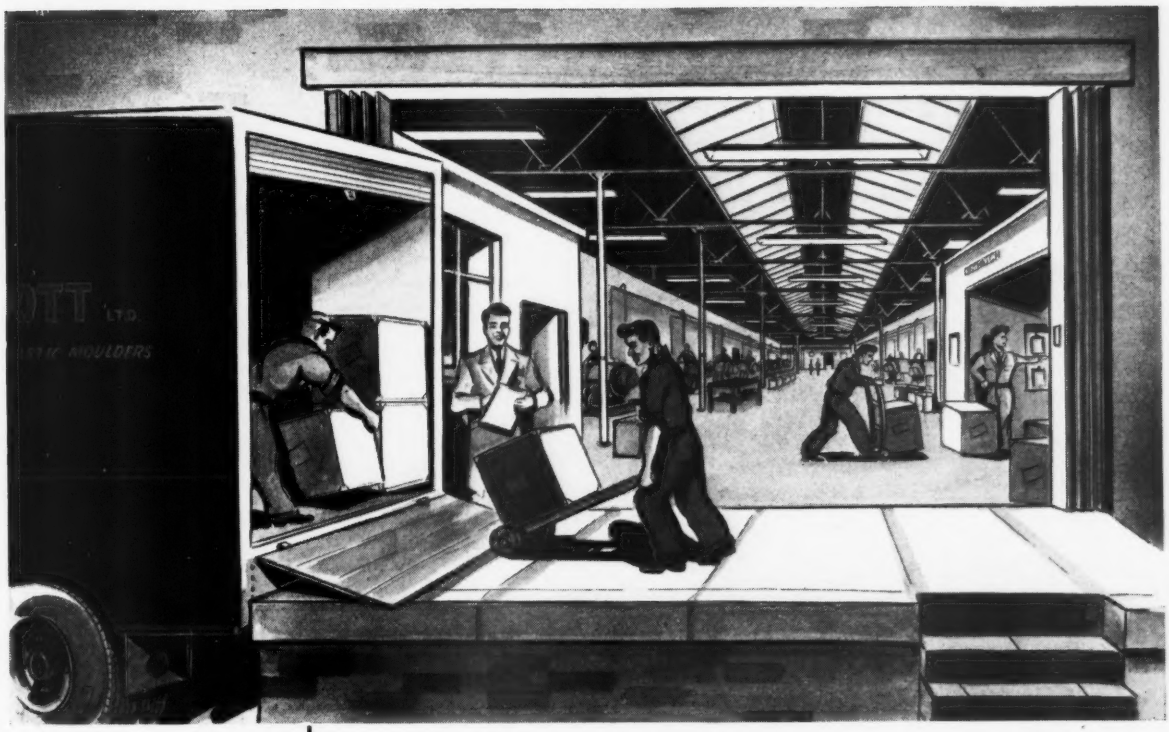
B.P. 720,837. Abrading article. A. Abbey. Comm. from: Carborundum Co.

A layer of granular abrasive is secured to a foam rubber backing by a water-insoluble adhesive composed of a rubber base blended with a phenol-aldehyde resinous condensation product.

B.P. 720,879. Device for protecting the cuffs of shirts when in wear. A. H. Thrower.

Moulded from transparent pliable plastic material with four holes for cuff links.

B.P. 720,894. Electrical insulating assemblies for leading a rod-shaped conductor carrying high voltage into a casing. To: N.V. "COQ." (Netherlands).



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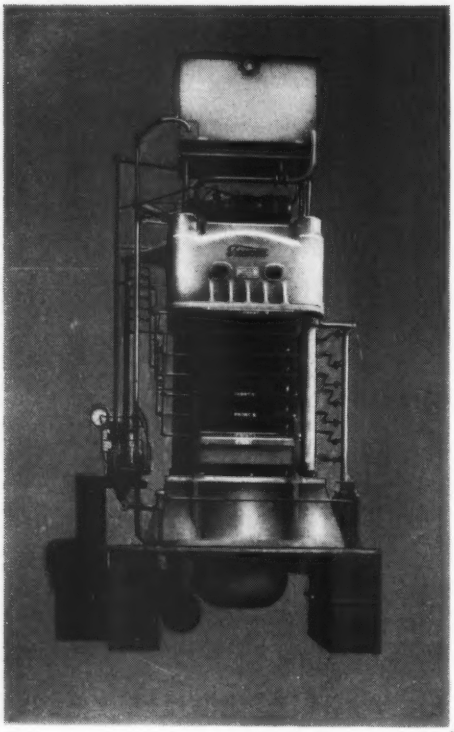
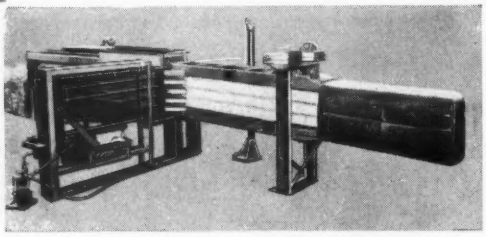
Right:—A Fawcett press for veneer and plywood. Easily adaptable for other materials. Made in various sizes as required.



The ever increasing part played by the rubber and plastics industries in modern economy has lead to a corresponding development in processing plant and technique. Leading the way are Fawcett Preston & Co. Ltd. who with nearly two hundred years' experience, offer a range of hydraulic and baling presses unsurpassed for reliability and efficiency.

Left:—Operated by its own self-contained pump, this 2,000-ton up-stroking multi-platen press is for pressing asbestos and synthetic materials.

Below:—A specially designed horizontal machine for baling synthetic fibres. Bales are delivered ready for transportation.



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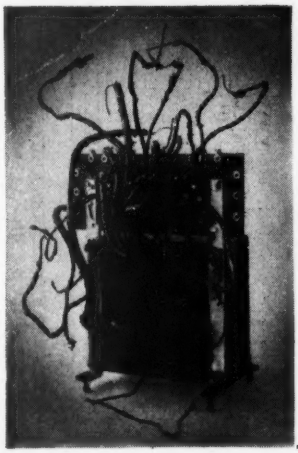
The illustrations show stages in the manufacture of transformer coils by Associated Electronic Engineers Ltd.



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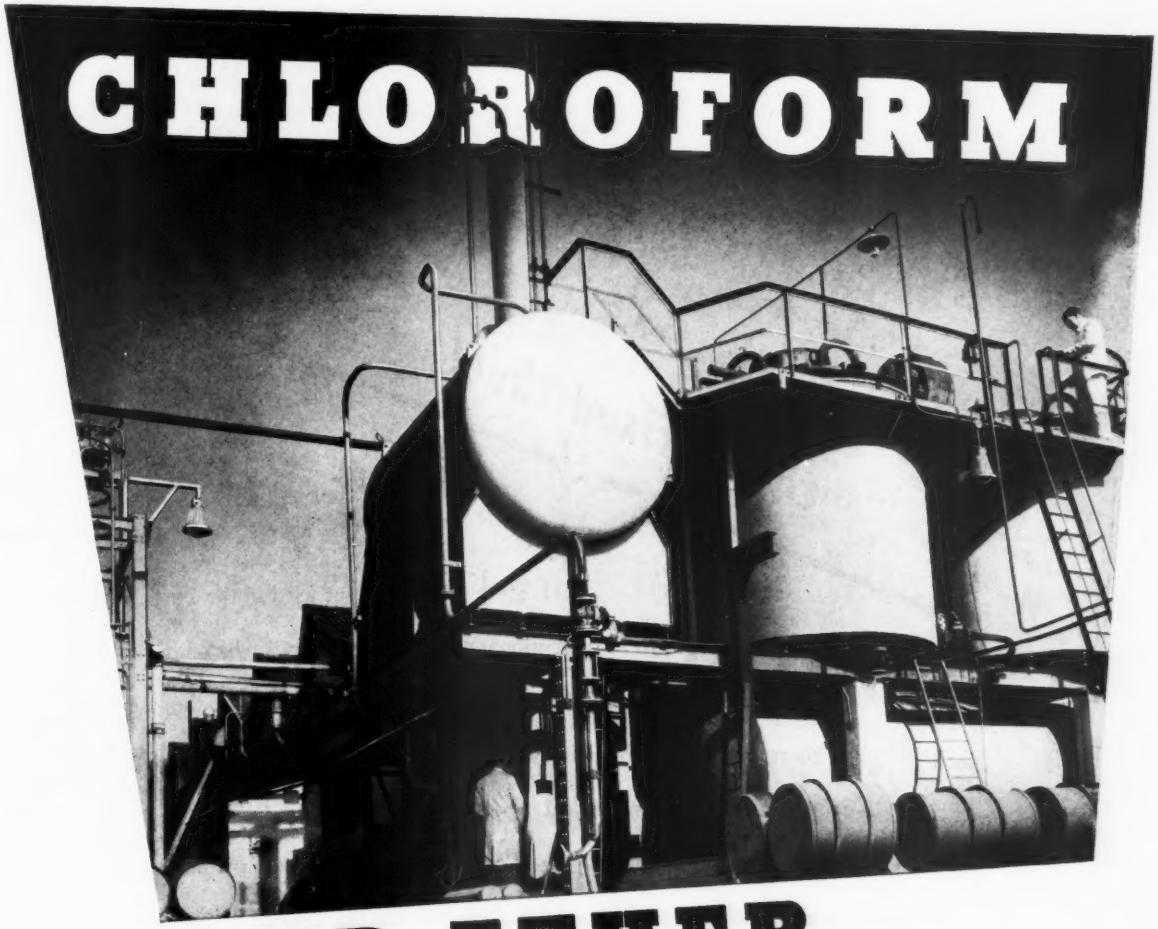

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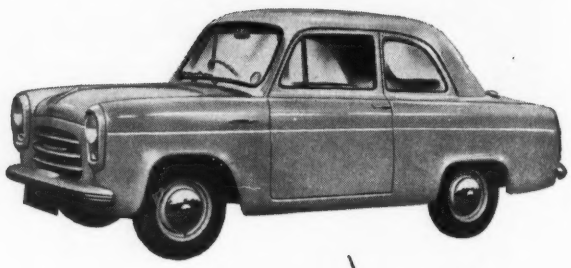

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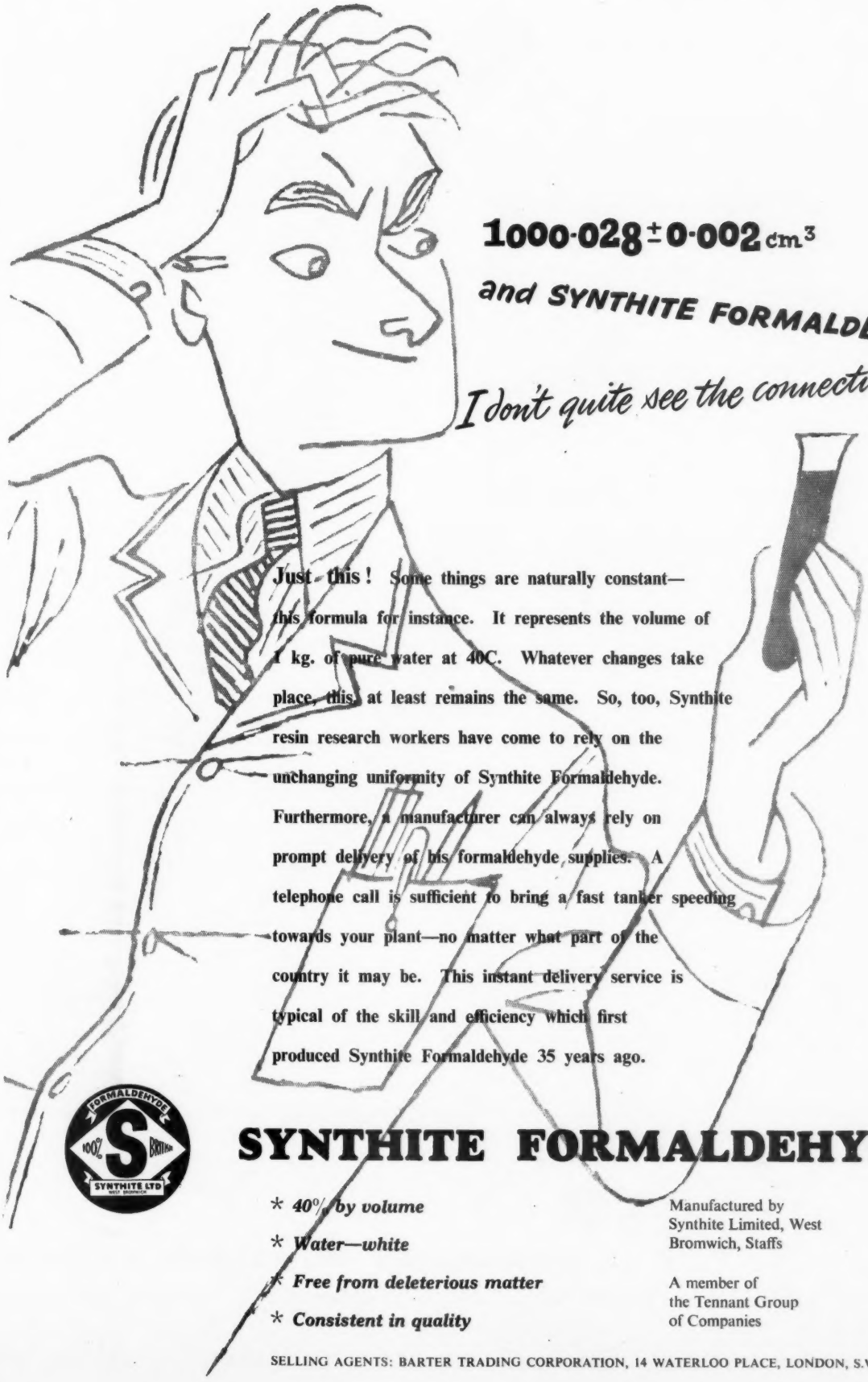

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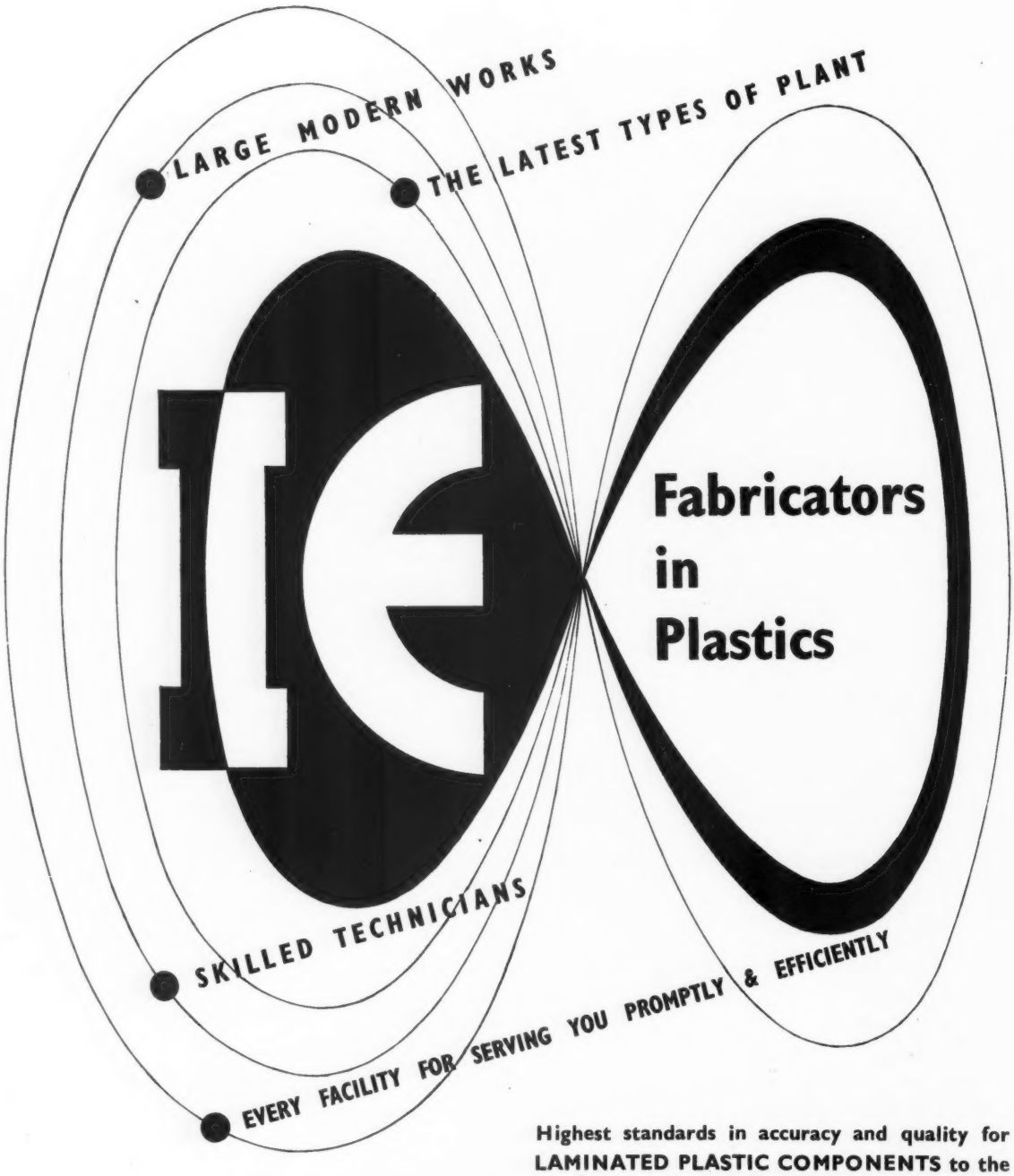

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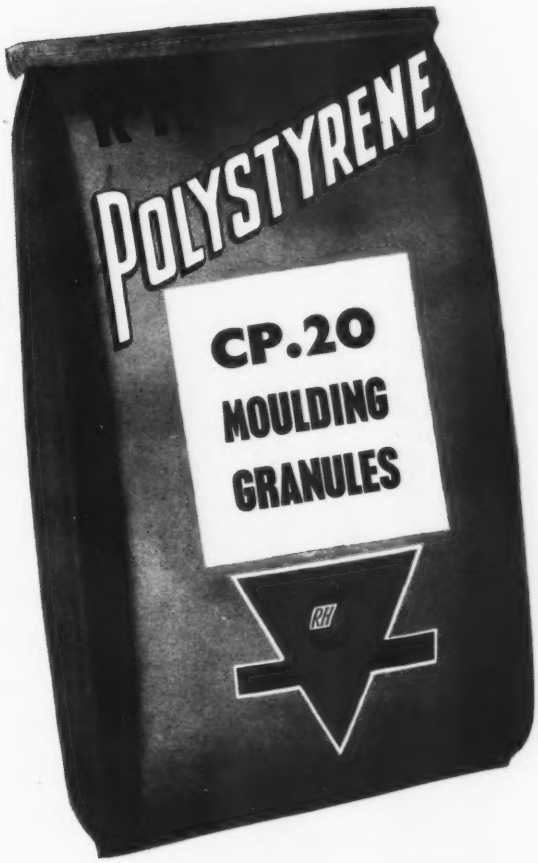

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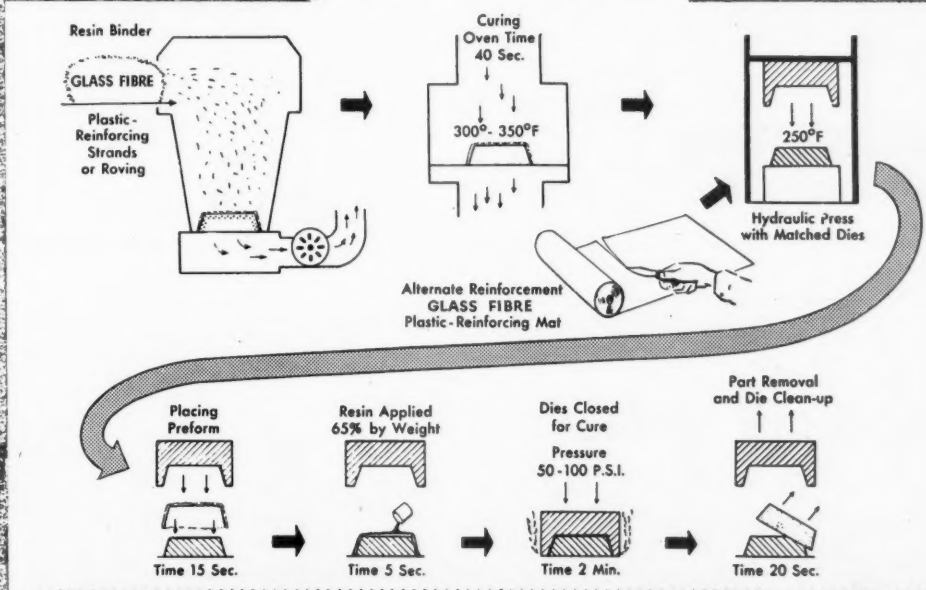

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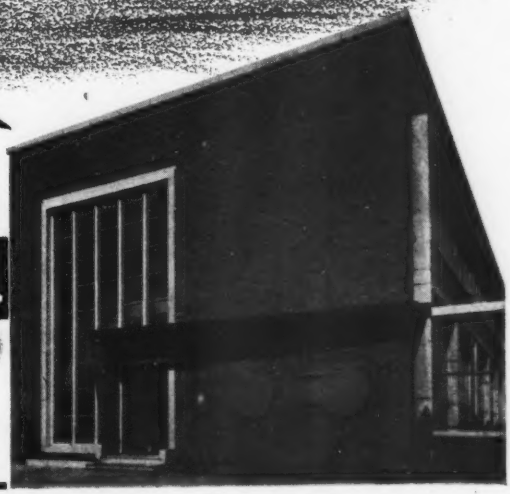

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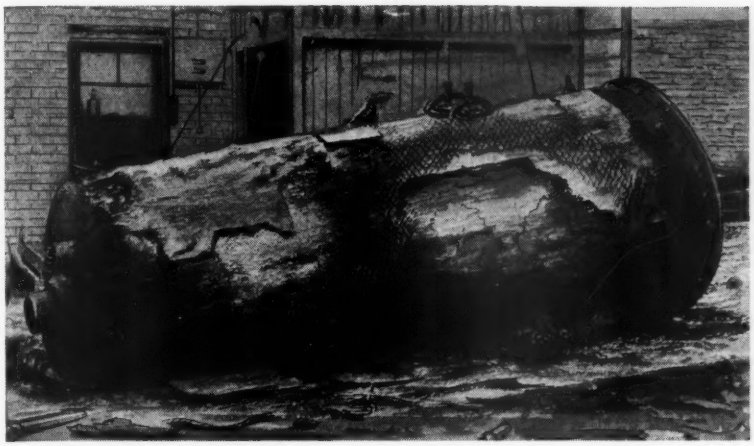

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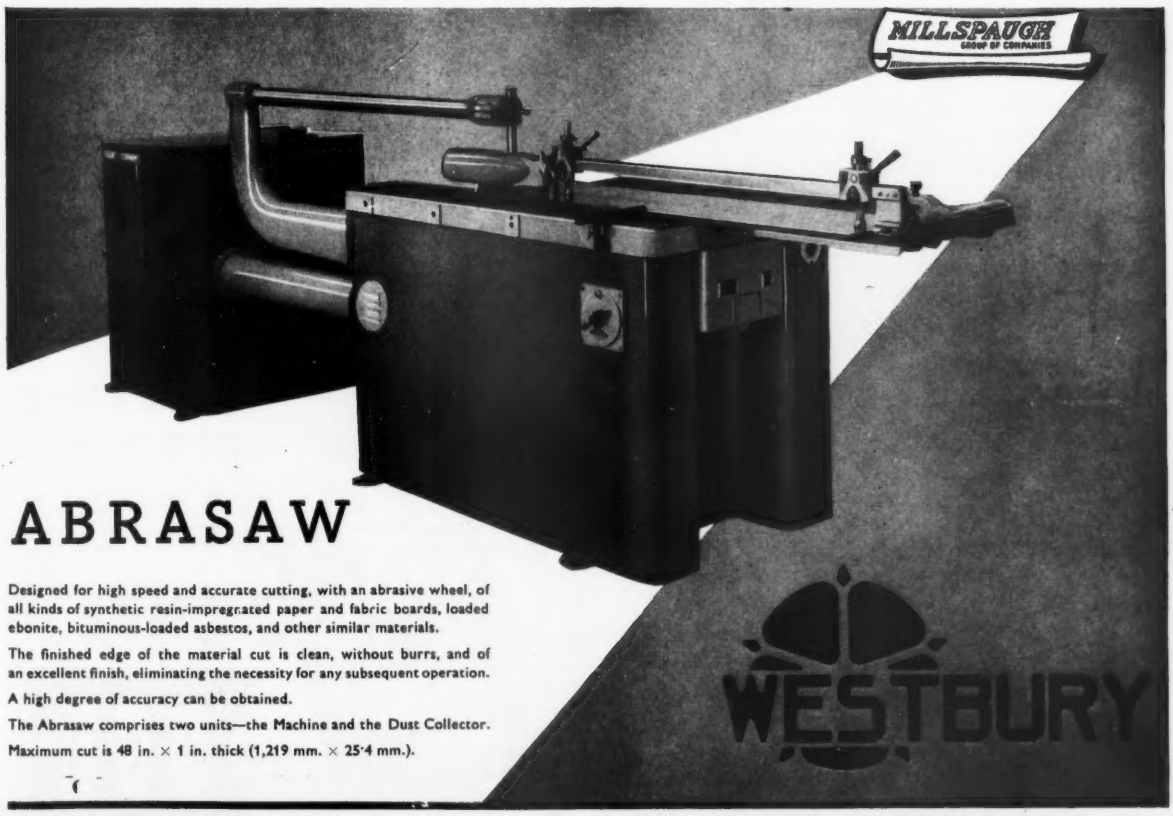

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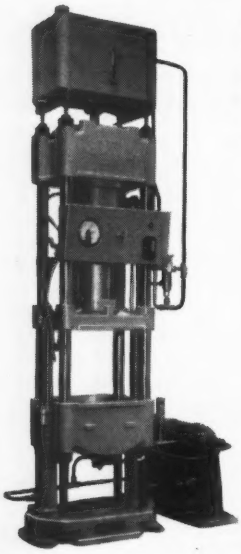

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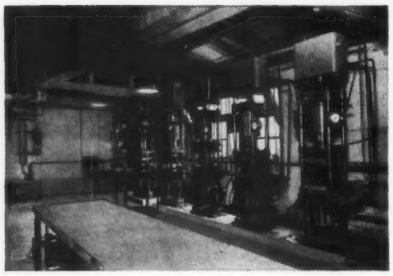

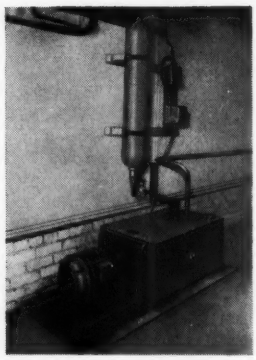

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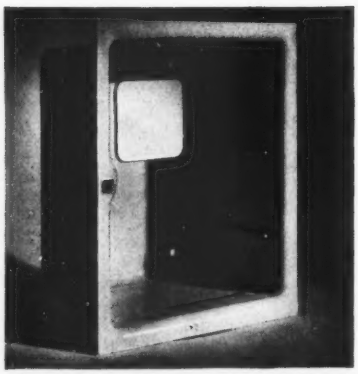

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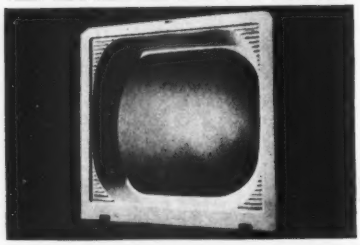

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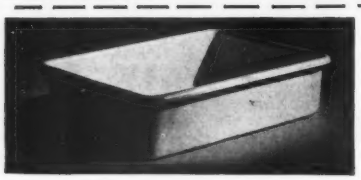

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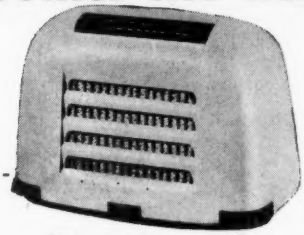

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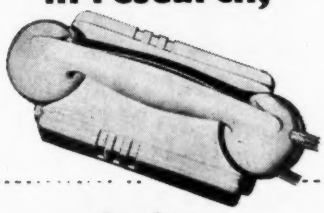

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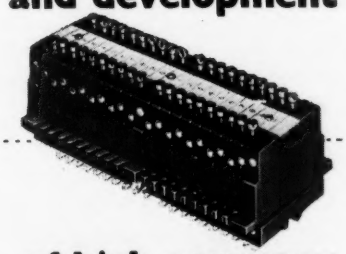

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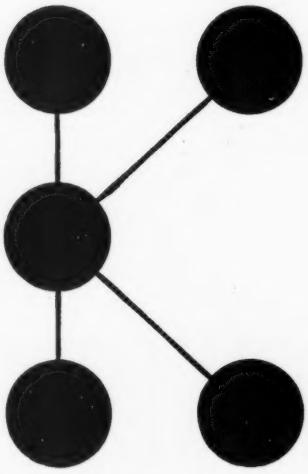

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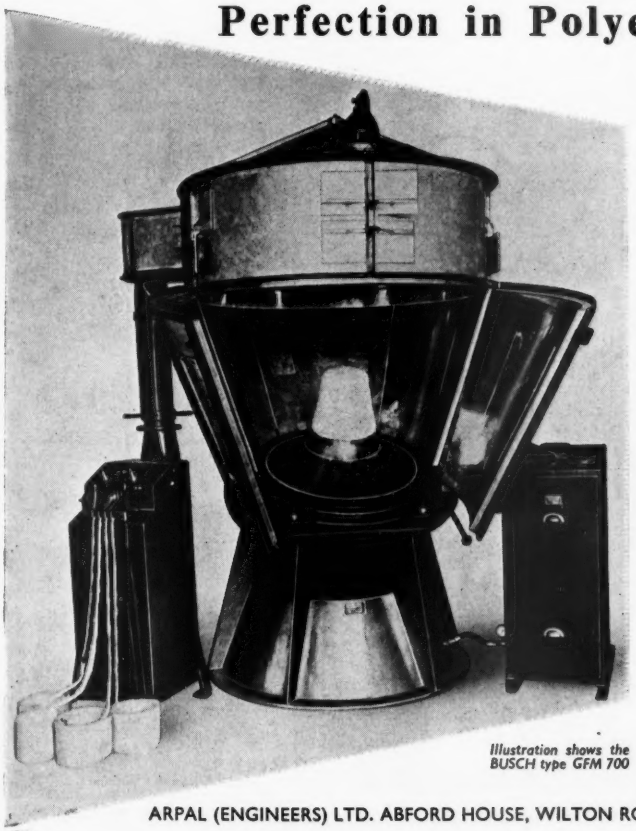

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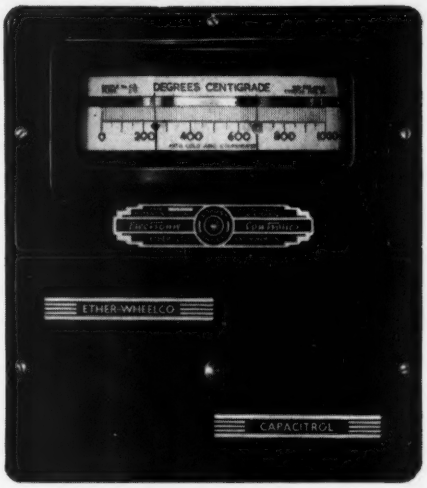

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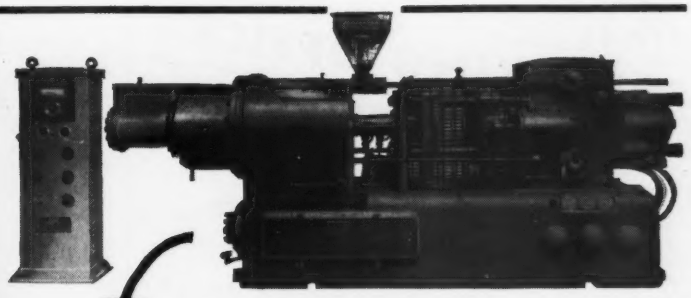

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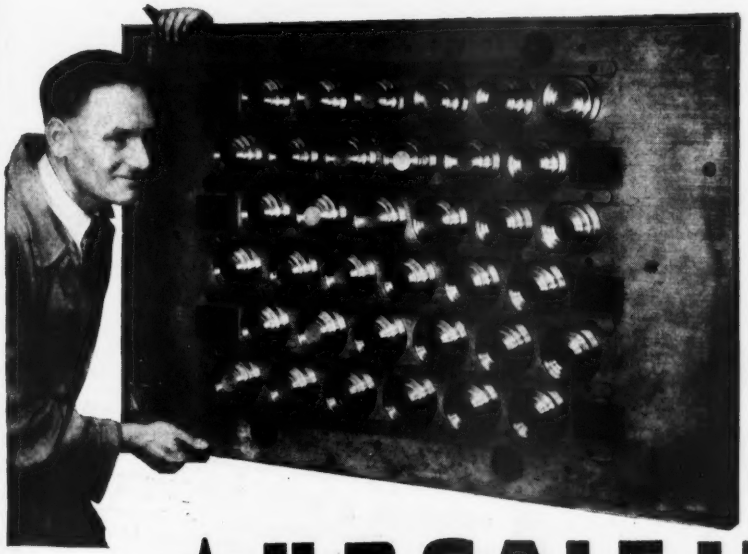

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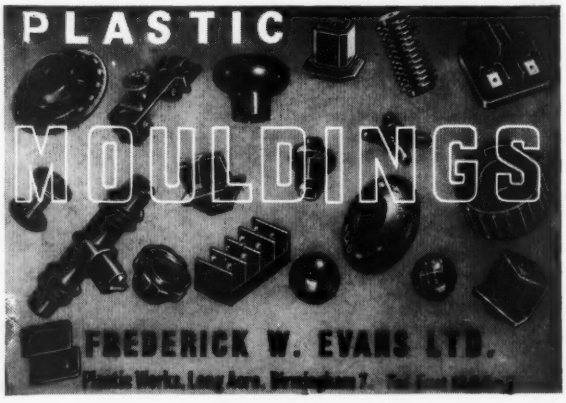

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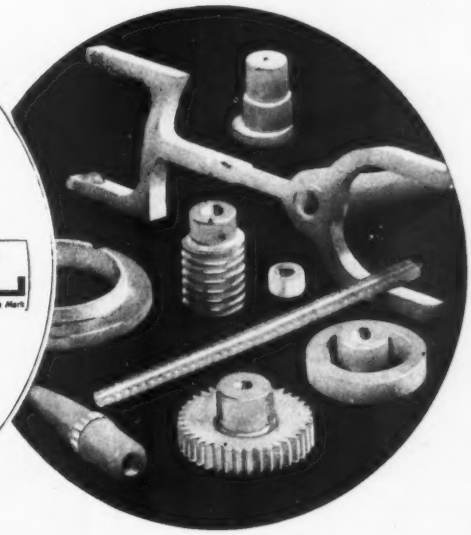

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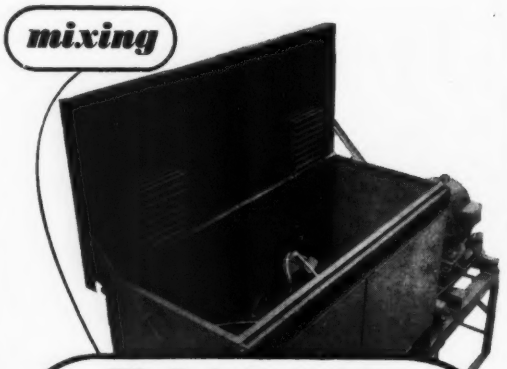

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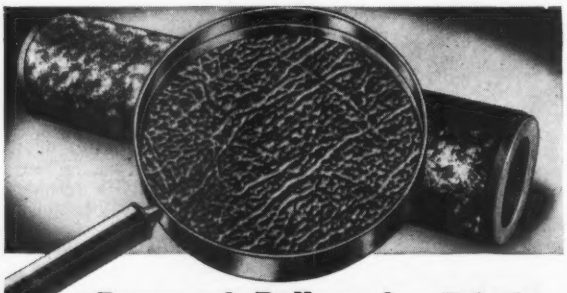

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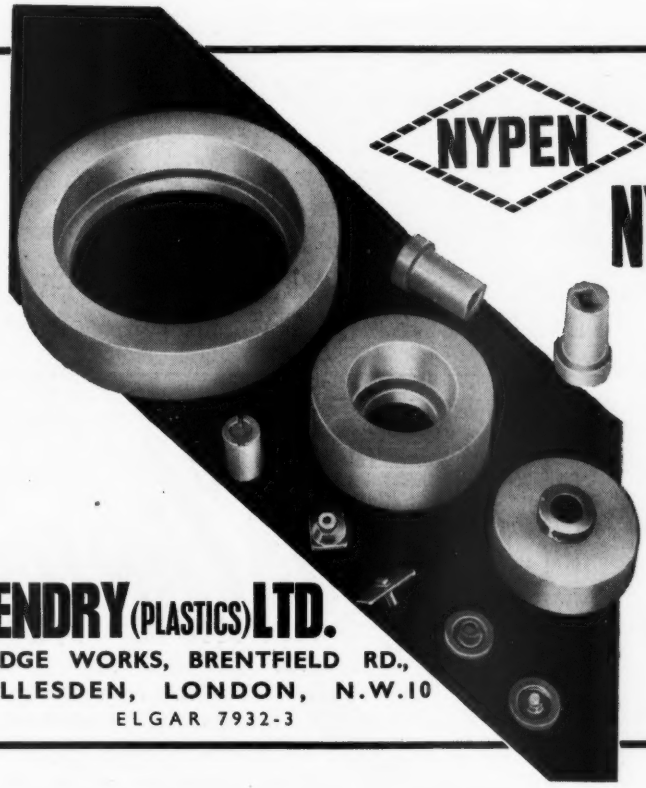

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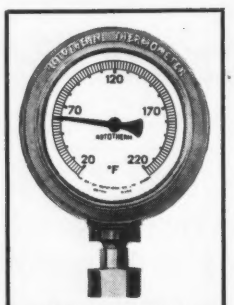

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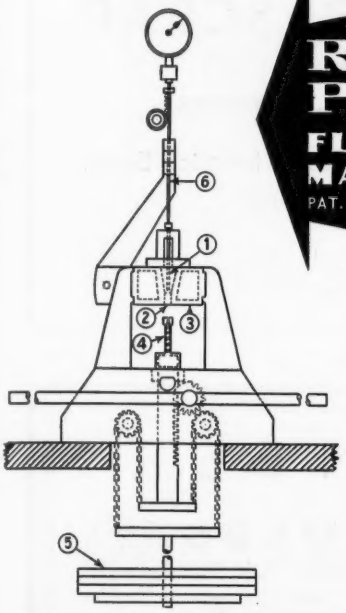

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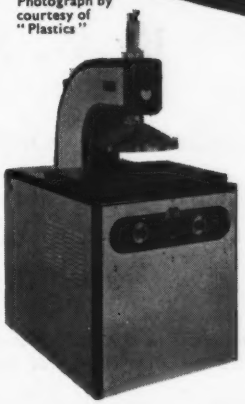

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Hydraulic Presses of all sizes. Injection Machines. Extruders. Mixing Mills. Hydraulic Pumps and Accumulators.
Send your inquiries to the specialists.
REED BROTHERS (ENGINEERING), LTD.,
REPLANT WORKS,
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150-TON DOWNSTROKE PRESS complete with pump and fittings. Box P114, care of "Plastics." 211-x7876

Machinery, Tools and Plant (contd.)

GRAMOPHONE RECORDS. Complete plant for making records for sale. Box P1141, care of "Plastics." 211-xA785

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620-ton Upstroke by Greenwood and Batley. 18¾-in. dia. ram by 20-in. stroke. Four cols. 30¼ in. by 13¾ in. between. Fully guided table 3 ft. by 30¼ in. Daylight 6 ft. 6 in. W.P. 2¾ tons sq. in.

400-ton Upstroke by Greenwood and Batley. 16-in. dia. ram by 28-in. stroke. Four cols. 20½ in. by 17¾ in. between. Table 36 in. by 17½ in. Daylight 41 in. W.P. 2 tons sq. in.

350-ton Downstroke by John Shaw. Four cols. Fitted 3 ft. sq. electric platens. Daylight 3 ft. Self-contained pumping equipment, prefill valve and tank.

250-ton Upstroke by Henry Berry. 15-in. dia. Fescolised ram by 20-in. stroke. Four cols. 2 ft. wide by 1 ft. between. Table 24 in. by 22 in. Daylight 20 in. W.P. 1½ tons sq. in.

200-ton Upstroke. 14-in. dia. ram by 10-in. stroke. Four cols. 25 in. by 15 in. between. Table 30 in. by 25 in. Daylight 12 in. With "Electraulic" pump and motor.

160-ton self-contained Downstroke by E.M.B. 12-in. dia. ram by 13-in. stroke. Fabricated frame. Tee slotted table and electric platens 24 in. by 19 in. Daylight 16 in. Complete with hydraulic ejector and transfer ram, prefill tank and Towler "Electraulic" pumping equipment.

150-ton Upstroke by Finney. 8-in. dia. ram by 20-in. stroke. Four cols. 14 in. by 14 in. between. Table 22 in. by 14 in. Daylight adjustable 22½ in. by 28½ in. W.P. 3 tons sq. in.

Two 150-ton Upstroke by Tangye. 14-in. dia. ram by 21-in. stroke. Four cols. 18½ in. by 18½ in. between. Table 2 ft. by 18 in. Daylight adjustable 16 in. to 29 in. Available with pushback rams. W.P. 1 ton sq. in.

100-ton Downstroke by Bradley and Turton. 12-in. dia. ram by 10-in. stroke. Four cols. 20½ in. by 11 in. between. Table 30 in. by 21 in. Fitted push-back rams. Daylight 21 in. Arranged prefilling. W.P. 1½ tons sq. in.

100-ton Downstroke by Finney. 12-in. ram by 20-in. stroke. Two 2-in. pushbacks. Four cols. 30½ in. by 14½ in. between. Tee slotted table 2 ft. sq. Daylight 32 in. Automatic prefilling with bottom hydraulic ejector. W.P. 1 ton sq. in.

80-ton Downstroke by Finney. 10½-in. dia. ram by 18-in. stroke. Two 2-in. dia. pushbacks. Four cols. 21 in. by 10 in. between. Tee slotted table 18-in. sq. Daylight 30 in. Bottom hydraulic ejector. Automatic prefilling. W.P. 1 ton sq. in.

70-ton Upstroke by Oran. 9-in. ram by 42-in. stroke. Four cols. 70½ in. by 18 in. between. Table 70½ in. by 44 in. Daylight 6 ft. W.P. 2,500 lb. sq. in.

Three 65-ton Downstroke by Rice 9-in. dia. ram by 10-in. stroke. Four cols. 13 in. by 13 in. between. Tee slotted table 21 in. by 13 in. Daylight adjustable 18 in.-22 in. W.P. 1 ton sq. in.

50-ton Downstroke "Coborn." 18-in. dia. ram with two 1½-in. dia. pushbacks. 14-in stroke. Four cols. 15 in. by 9 in. between. Table 17 in. by 15 in. With electric platens 17½ in. by 14½ in. Daylight 17½ in. Fitted lower ejector ram, prefil valve and tank, and Towler "Electraulic" pump and motor.

30-ton Upstroke. 8½-in. dia. ram by 6-in. stroke. Four cols. 65 in. by 17 in. between. Table 58 in. by 27 in. Daylight between two steam platens, each 5 ft. by 30 in. is 5¼ in. Operated by hand pump. W.P. ½ ton sq. in.

GEORGE COHEN SONS AND CO., LTD.,
WOOD LANE, LONDON, W.12.
Phone, Shepherd's Bush 2070
AND
STANNINGLEY, NR. LEEDS.
Phone, Pudsey 2241. 211-1

MACHINERY, TOOLS AND PLANT WANTED

COMPRESSION AND INJECTION MOULDING TOOLS WANTED. Send details of your surplus, obsolete and redundant moulding tools. Box P0720, care of "Plastics." 212-1082

INJECTION-MOULDING MACHINES required. Condition or size not important. Send details. Box P0814, care of "Plastics." 213-1090

WANTED FOR OWN USE, a 1-oz. to 2-oz. power injection moulding machine, also comb moulds of any kind. Box P115, care of "Plastics." 211-x7863

INJECTION MOULDING MACHINES required. Size or condition not important. Details to Box P1126, care of "Plastics." 211-17

MANUFACTURER requires machines for speciality moulding in conjunction with own products, not marketed to public. Moulders having machines for disposal and not wishing them to go into firms in direct competition are asked to write in confidence to Box P1132, care of "Plastics." 211-18

ONE HORIZONTAL STORAGE TANK, glass lined or similar, capacity 5,000 gallons.
One 50-gallon and three 150-gallon capacity vertical cylindrical open-topped tanks, aluminium or rubber lined.
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One 250/350 lb. capacity ball mill, porcelain or Steartite.
One Stainless-steel mixer, 150 gallons capacity, drive suitable for 15 h.p., electricity supply 400/440 3-ph., 50-cy. Box P1130, care of "Plastics." 211-21

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Use a trade mark. Consult
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12 Church St., Liverpool. zzz-478

MOULDS

MOULDS FOR DISPOSAL. In excellent condition. For various popular fancy lines. Home and Export inquiries invited. Details, prices and samples in application. Box P1137, care of "Plastics." 211-26

MOULDS WANTED

REQUIRED. Good second-hand plastic moulds to suit "Peco" 2-oz. machine. Box P1131, care of "Plastics." 211-29

WE ARE INTERESTED in buying second-hand moulds for 3-oz.-8-oz. injection moulding machines; also extruding machine in good condition. Box P1128, care of "Plastics." 212-1107

SECOND-HAND MOULDS for polythene kitchenware, etc., for 8-oz./30-oz. injection moulding machine wanted for export. Box P1140, care of "Plastics." 211-xB7875

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THE PROPRIETORS OF PATENT NO. 594835 for "Method for the Preparation of Wood Pulp," desire to secure commercial exploitation by licence or otherwise in the United Kingdom. Replies to Haseltine Lake and Co., 28 Southampton Buildings, Chancery Lane, London, W.C.2. 211-9

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IF YOU NEED
IMMEDIATE AND INEXPENSIVE
INJECTION MOULDING CAPACITY
FROM 2 TO 32 OZS.
(BUT ESPECIALLY 8 OZ.)
CONTACT US WITHOUT DELAY.
AT BOX P0513,
CARE OF "PLASTICS.5" 211-3

Production Capacity (contd.)

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KINGSTON PLASTICS, LTD., Unity Works, Union St., Kingston-on-Thames. Manufacturers of virgin and second-grade cellulose acetate moulding powders, matched to customer's own requirements for colour and flow. Customer's own waste also reprocessed to specified requirements. Sorting and grinding incorporating magnetic separation of metallic particles of all thermoplastics undertaken. Phone, Kingston 8405. 213-1084

DINES PRODUCTS, Whitehall Lane, Grays, Essex, for injection mouldings. 211-1050

CHIPPING OF PLASTICS AND GRINDING, screening, mixing and drying of all raw materials undertaken for the trade. Crack Pulverizing Mills, Ltd., Plantation House, London, E.C.3. Man 4405. zzz-487

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SHORT RUNS A SPECIALITY: LONG RUNS A PLEASURE. Low mould cost and overheads. Injection capacity and technical knowledge at your service. Westminster Plastics, Temple Works, 41 Old Church Rd., Chingford, E.4. Silverthorne 7927. 212-01055

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Large assembly shops.
Capacity up to 500-ton compression and 10-oz. injection.
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COMPRESSION AND INJECTION MOULDING capacity immediately available in all thermosetting and thermoplastic materials. Customers' own moulds can be used or tools provided in our up-to-date toolroom. Box P996, care of " Plastics." 211-34

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VACUUM-FORMING CAPACITY available together with full facilities for fabricating, engraving and printing of all plastic materials. Omega Plastics, Ltd., Highbridge Rd., Town Quay, Barking, Essex. 211-13

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SPECIALISTS IN
FABRICATION, INJECTION MOULDING AND ENGRAVING.
11 WHITWORTH STREET,
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Central 7081-2 and Central 1000. zzz-493

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VACUUM-FORMED PLASTIC ARTICLES for all trades. Low-cost tools aand rapid production from the most modern equipment opens up new applications for many industries. Please send your inquiries to Torbex, Ltd., 62 High St., Croydon, Surrey. 211-x7770

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SHEETS UP TO 1 IN. THICK.
CELLULOSE ACETATE
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CUEX, LTD., can offer all at prices well below current list:—
Polystyrene.
Cellulose acetate.
Polyethylene.
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MANCHESTER, 1.
Central 7081-2 and 1000. zzz-494

NYLON, coloured, reground injection scrap, small quantities regularly for sale. Offers invited. Box P1023, care of " Plastics." 211-43

PHENOL FORMALDEHYDE, alkali resisting, some tons surplus to requirements for sale. Box P1015, care of " Plastics." 211-40

POLYSTYRENE, reground, various colours and mottled, for disposal. Please inquire Box P1019, care of " Plastics." 211-39

POLYSTYRENE, PEARL, some light colours, new material, below cost price. Box P1021, care of " Plastics." 211-38

FOR HOME AND EXPORT MARKET. We sell at low prices, all plastic scraps, Acetate, Polystyrene, Alkathene, reground powders and reconditioned powders. Apply to Box P009, care of " Plastics." 211-35

BLACK CELLULOSE ACETATE MOULDING POWDER. We can always supply first grade at 2s. per lb., any quantity. Box P008, care of " Plastics." 211-33

RUBY RED DIAKON REGROUND, several tons available for immediate delivery. Contact Box P1142, care of " Plastics." 211-37

RAW MATERIAL WANTED

WANTED, Polythene scrap. Write to Box P7416, care of " Plastics." zzz-0322

SURPLUS STOCKS of thermosetting and thermoplastic moulding powders wanted. Send details Box P056, care of " Plastics." zzz-481

ERLANOS, LTD., 93 Aldersgate St., E.C. (Monarch 4686), require Perspex and cellulose offcuts and scrap, clear and coloured, highest prices paid. 217-1079

Raw Material Wanted (contd.)

PERSPEX. We buy scrap, offcuts, surplus and redundant stocks. L. Glazer and Son, Ltd., 275 Neasden Lane, N.W.10. Gladstone 7362. 211-1092

SCRAP.
WE BUY
ALL THERMO-PLASTICS. REJECTED MOULDED PIECES. OBSOLETE MOULDING POWERS. LUMPS, SPRUES AND RUNNERS.
AND PAY HIGHEST PRICES.
J. W. NASH AND CO., LTD.,
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Ladbroke 4655. 211-34

P.V.C. GARMENT AND HANDBAG OFFCUTS wanted. We collect and pay cash. Brockwell Plastics, Ltd., 50 Hollingbourne Rd., S.E.24. zzz-490

PROMPT CASH OFFERED for virgin and reprocessed cellulose acetate and polystyrene. Give manufacturer's name and packing. Box P873, care of " Plastics." zzz-491

WANTED, large quantities regularly for export for a large import concern on the Continent such as all types of scrap materials P.V.C. Monthly requirements up to 50-80 tons, Saran scraps, P.P.C. slabs, etc. Box P112, care of " Plastics." 211-x7614

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CELLULOSE ACETATE SHEETING, clear 10 to 20 thou., any surplus lots required. Please offer with particulars to Box P1011, care of " Plastics." 211-42

ACETATE SCRAP, optical or sprues and runners and wasters in light colours without navy and red, three tons urgently wanted. Please quote. Box P1013, care of " Plastics." 211-41

POLYTHENE AND POLYSTYRENE, any quantities of virgin material, scrap, nozzle lumps, urgently wanted. Please offer with samples to Herbert Connor, Ltd., 120 Beaufort Park, Falloden Way, London, N.W.11. 211-37

SITUATIONS VACANT

The engagement of persons answering advertisements in respect of vacant situations must be made through a local office of the Ministry of Labour, or a scheduled employment agency, if the applicant is a man between the ages of 18 and 64 inclusive or a woman between the ages of 18 and 59 inclusive, unless he or she, or the employment, is excepted from the provisions of Notification of Vacancies Order, 1952.

P.V.C. CHEMIST/TECHNOLOGIST required for production control and development. Some experience of the coated fabrics industry would be an advantage but is not essential.
Applications stating qualifications and salary required will be treated in confidence and should be addressed to the Managing Director, Bernard Wardle (Everflex), Ltd., Peblig Mill, Caernarvon. 211-1104

MOULD DESIGNER (free lance) for design of compression moulds for electrical accessories. Only fully experienced man having wide knowledge of design and moulding technique need apply. London area preferred but not essential. Generous fees. State details of experience in first instance which will be treated in strictest confidence. Staff have been advised of this advertisement. To Director, Box P107, care of " Plastics." 211-1105

SENIOR ESTIMATOR for mould makers and injection moulders, good engineering, drawing office experience essential. High salary with good prospects of advancement for experienced man.
Apply by letter with full details to Stewart Plastics, Ltd., Purley Way, Croydon. 211-44

FIRST - CLASS EXPERIENCED PLASTIC MOULDER capable of trying out moulds, instructing new operators and able to take charge if required.
Compression experience essential, injection or exclusion useful. Permanent position, housing assistance possible in South Buckinghamshire. Full particulars. Box P1138, care of " Plastics." 211-27

EXPERIENCED SALES REPRESENTATIVE with existing connection amongst industrial manufacturers required by Plastic Moulders and Fabricators and manufacturers of glass reinforced components. Remuneration on commission basis.
Apply Box P1122, care of " Plastics." 211-10

COST ESTIMATOR required for London Plastics Co. High salary rate for fully experienced man. Progressive position leading to higher executive post.
Write full details to Managing Director, Box P1123, care of " Plastics." 211-11

PLASTICS TECHNOLOGIST required for technical control of newly established thermo-plastics production unit of a large progressive manufacturing organization on the outskirts of London.
Applicants must be experienced in the formulation and extrusion of P.V.C. and preferably knowledge of injection moulding. Attractive salary according to age and experience
Write giving age, education, qualifications, and experience to Box P1124, care of " Plastics." 211-14

Situations Vacant (contd.)

MOULDING SHOP FOREMAN required to take full charge of thermo setting press shop, considerable experience in all branches will be necessary including knowledge of the usual hydraulic gear and various forms of heating.

This job does offer considerable scope for the right man who must be prepared to work and show real initiative.

Applicants please apply in writing giving full details of previous experience both administrative and purely technical to Birkbys, Ltd., Sharston Rd., Wythenshawe, Manchester. 211-16

FOREMAN-TOOLMAKER required to establish and run toolroom in a rapidly expanding plastics company in the London area. Must have experience of all types of injection moulds, press tools and jigs for assembly and finishing operations, etc. Good prospects for man with ability and experience. Box P1125, care of "Plastics." 211-19

QUALIFIED AND EXPERIENCED PLASTICS CHEMIST required for interesting development work. Full details including renumeration to Box P1129, care of "Plastics." 211-20

NEW ZEALAND. Company with substantial production of decorated laminated plastics sheet require a first-class manager for their N.Z. branch. Wide production experience essential. Sales promotion an advantage. Excellent prospects.

Write giving fullest particulars, A.C.I., Ltd., 44 Bedford Row, W.C.1. 211-23

APPLICATIONS ARE INVITED from first-class salesmen—preferably Scottish nationals—to fill a vacancy within the organization of one of Britain's leading plastic manufacturers.

Applicants should have, if possible, previous experience in handling p.v.c. films, with particular reference to the rainwear, making-up, fancies and pharmaceutical trades. Remuneration will be by salary and commission, and the position is pensionable. A car will be provided. Our own employees have been notified of this vacancy and applications, which will be treated in the strictest confidence, and which should give full particulars of past experience, should be forwarded to Box P1136, care of "Plastics." 211-25

ANALYTICAL CHEMIST required to create and head up quality control department of expanding manufacturing organization in N.W. London. Initiative and keenness are essential qualities.

Apply with details of previous experience to Box P1135, care of "Plastics." 211-24

Situations Vacant (contd.)

EXTRUSION OPERATOR. Large American custom extrusion house looking for experienced man to assist plant supervisor in extrusion set up, die design, etc. Must have experience in the extrusion of one or more of the following materials: cellulosics, acrylic, styrene, polyethylene and nylon. Will help relocate right man. Box P1133, care of "Plastics." 211-1111

ASSISTANT CHEMIST required to help in the running of a section devoted to reinforced plastics. Scope for man with initiative and practical ability. Superannuation scheme.

Hawley Products, Ltd., Garman Rd., Tottenham. 211-2

SENIOR CHEMIST required with a knowledge of synthetic resins and rubber technology to take charge of a specialized laboratory. Candidates must have had at least four years, technology experience in chemical control and analysis in a senior capacity. Some experience in this field an advantage. Age 25-40, with degree of technological qualification. The laboratory, which is shortly to be opened, will be in pleasant surroundings in the Reading area. Box P117, care of "Plastics." 211-3

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Applications, with full details of experience, to Box P118, care of "Plastics." 211-4

ASSISTANT SALES MANAGER required for prominent plastic manufacturers, must have good experience and specialized knowledge of distribution to hardware wholesalers and the marketing of domestic ware. Write, Box A.88, Willing's, 362 Gray's Inn Rd., London, W.C.1. 211-5

APPLICATIONS ARE INVITED for the position of production engineer on the technical staff of a well-known toy manufacturer.

Knowledge of plastic materials and experience of mass-production of metal and/or plastic parts and assembly of same desirable, age limit 35 years, salary according to qualifications and experience, but not less than £750 p.a. Reply Box P119, care of "Plastics." 211-6

SALES REPRESENTATIVE for p.v.c. shrink sleeving and compression and injection mouldings for Midlands and Northern area. Previous experience in plastics and connections essential, salary, commission and expenses.

Application in writing, giving full details of qualifications, experience and salary required to Sales Manager, Lacrinoid Products, Ltd., Gidea Park, Essex. 211-7

Situations Vacant (contd.)

QUALIFIED CHEMIST required, aged 23 to 30, for engineering works in North-west London. Interesting post for man with experimental outlook, superannuation, B.Sc. or similar degree necessary.

Reply with full details of age, experience and salary required to Box P1120, care of "Plastics." 211-8

TWO TECHNICAL SALES REPRESENTATIVES required by old-established firm of injection trade moulders. One resident in or near Manchester and to cover Northern England. The second to be resident in the Midlands and to cover surrounding territory. We have a pension scheme in operation and this is a permanent position that offers excellent opportunities to the right man able to talk and sell custom injection mouldings. Our own staff know of this advertisement.

Please send full details of experience and salary expected, and any further information of personal record in strictest confidence to Box P1139, care of "Plastics." 211-28

SITUATIONS WANTED

GENERAL FOREMAN, 20 years experience in compression and injection moulding, seeks similar post. Box P1121, care of "Plastics." 211-x7903

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INDEX TO ADVERTISERS

Name	Page
A	
Arpal (Engineers), Ltd.	77
Associated Lead Manufacturers, Ltd.	44
B	
Bakelite, Ltd.	50, Inside Back Cover
Barber & Duffy, Ltd	88
Beck Koller & Co (England), Ltd.	67
Beecham Buildings, Ltd.	38
B.I.P. Tools, Ltd.	63
Birkbys, Ltd.	12
Blagden, Victor, & Co.	82
B.L.C. (Exports), Ltd.	86
Boake, A., & Roberts Co., Ltd.	43
Bradley & Turton, Ltd.	40
Brand, Ed., Ltd.	75
Bridge, David, & Co., Ltd.	20
British Electrical Development Association, The	29
British Geon, Ltd.	57
British Industrial Plastics, Ltd.	35
British Oxygen Co., Ltd., The	10, 41
British Resin Products, Ltd.	8
British Rototherm Co., Ltd., The	86
BX Plastics, Ltd.	Inside Front Cover
Byson Appliance Co, Ltd.	84
C	
Calderon, M., Ltd.	84
Canning, W., Ltd.	86
Case Development Co., Ltd.	76
Castle, John & Co., Ltd.	86
Chamberlain & Willows	84
Chase, Bernard	32
Cohen, George, Sons & Co., Ltd.	79
Cole, E. K., Ltd.	16
Cole, R. H., & Co., Ltd.	65
Courtaulds, Ltd.	53
Coventry Motor & Sundries Co., Ltd.	66
Crystalate, Ltd.	26
D	
Dale, John, Ltd.	1
Design	14
Dixon, Arthur, & Co., Ltd.	82
Dunbar & Cook, Ltd.	87
Durable Plastics, Ltd.	80
E	
East Anglia Plastics, Ltd.	21
Elliott, E., Ltd.	55
Elm Plastics, Ltd.	87
Empire Plastics (Birmingham), Ltd.	88
Engis, Ltd.	28
Erinoid, Ltd.	Back Cover, 23
Ether, Ltd.	77
Evans, Frederick W., Ltd.	80
E.V.B. Plastics, Ltd.	33
F	
Fawcett, Preston & Co., Ltd.	56
Ferguson, James & Sons, Ltd.	17, 68
Fibreglass, Ltd.	58
Finney Presses, Ltd.	70
Firth Thos., & J. Brown Co., Ltd.	34
Forth Chemicals, Ltd.	22
Fraser & Glass, Ltd.	7
G	
Gardner, Wm. & Sons, Ltd., Gloucester	13
Gas Council, The	6
Geigy Co. Ltd., The	30
General Electric Co., Ltd., The	45
German Plastics Exhibition	75
Glass Yarns & Deeside Fabrics, Ltd.	73
Gosheron, John & Co., Ltd.	68
Griffiths, Gilbart, Lloyd & Co., Ltd.	70
Grist Plastics	31
H	
Haigh, John, & Co., Ltd.	83
Halden, J. & Co., Ltd.	78
Harris Plastics, (Richmond), Ltd.	81
Harvey, G. A. & Co. (London), Ltd.	71
Herbert, Alfred, Ltd.	27
Hercules Powder Co., Ltd.	2
Hill Bros. (Service), Ltd.	84
Hornflowa, Ltd.	42
I	
Imperial Chemical Industries, Ltd.—Billingham Chemical Products	24
Imperial Chemical Industries—Dyestuffs	18
Imperial Chemical Industries, Ltd.	Front Cover
Industrial Appliances, Ltd.	49
Industrial Plastics, Ltd	5
Insulation Equipments, Ltd.	64
K	
Kent Mouldings	73
Kleestron, Ltd.	37
L	
Lavino (London), Ltd.	48
London & Scandinavian Metallurgical Co., Ltd.	85
M	
Marshall, C. & C., Ltd.	85
Martin, T. G., & Co.	84
May & Baker, Ltd.	59
Melwood Thermoplastics, Ltd.	74
Mentmore Manufacturing Co., Ltd.	4
Microcell, Ltd.	76
Miltoid, Ltd.	71
Monsanto Chemicals, Ltd.	22
N	
National Plastics (Sales), Ltd.	52
Nu-Swift, Ltd.	84
P	
Pascall Engineering Co., Ltd., The	82
Pendry (Plastics), Ltd.	85
Pickstone, R. E., Ltd.	86
Plant Installations, Ltd.	25
Plastic Engineers, Ltd.	81
Plysu Products, Ltd.	62
Punfield & Barstow (Mouldings), Ltd.	54
Pure Chemicals, Ltd.	92
R	
Radio Heaters, Ltd.	87
Redifon, Ltd.	78
Reliance Trading Co.	84
Resinoid & Mica Products, Ltd	80
R. F. Development Co., Ltd.	82
Rootes Mouldings, Ltd.	36
Rubber Improvements, Ltd.	9
S	
Sale, H. B., Ltd.	79
Scott Bader & Co., Ltd.	46
Shaw, Francis & Co., Ltd.	39
Simmonds Aerocessories, Ltd.	60
Simon, Henry, Ltd.	3
Smith, Stanley & Co.	72
Spicers, Ltd.	78
Steele & Cowlishaw, Ltd.	72
Stevens, Michael, S.	88
Sturge, John, E., Ltd.	80
Styrene Products, Ltd.	Back Cover
Synthite, Ltd.	61
T	
Textile Paper Tube Co., Ltd., The	83
U	
U.K. Plastics, Ltd.	83
United Ebonite & Lorival, Ltd.	47
Universal Metal Products, Ltd.	19
Utilex, Ltd.	74
V	
Vacuum Industrial Applications, Ltd.	15
Vulcan Boiler & General Insurance Co., Ltd., The	69
W	
Westbury Engineering Co., Ltd.	69
Wiggins, Teape & Alex Pirie (Sales), Ltd.	11

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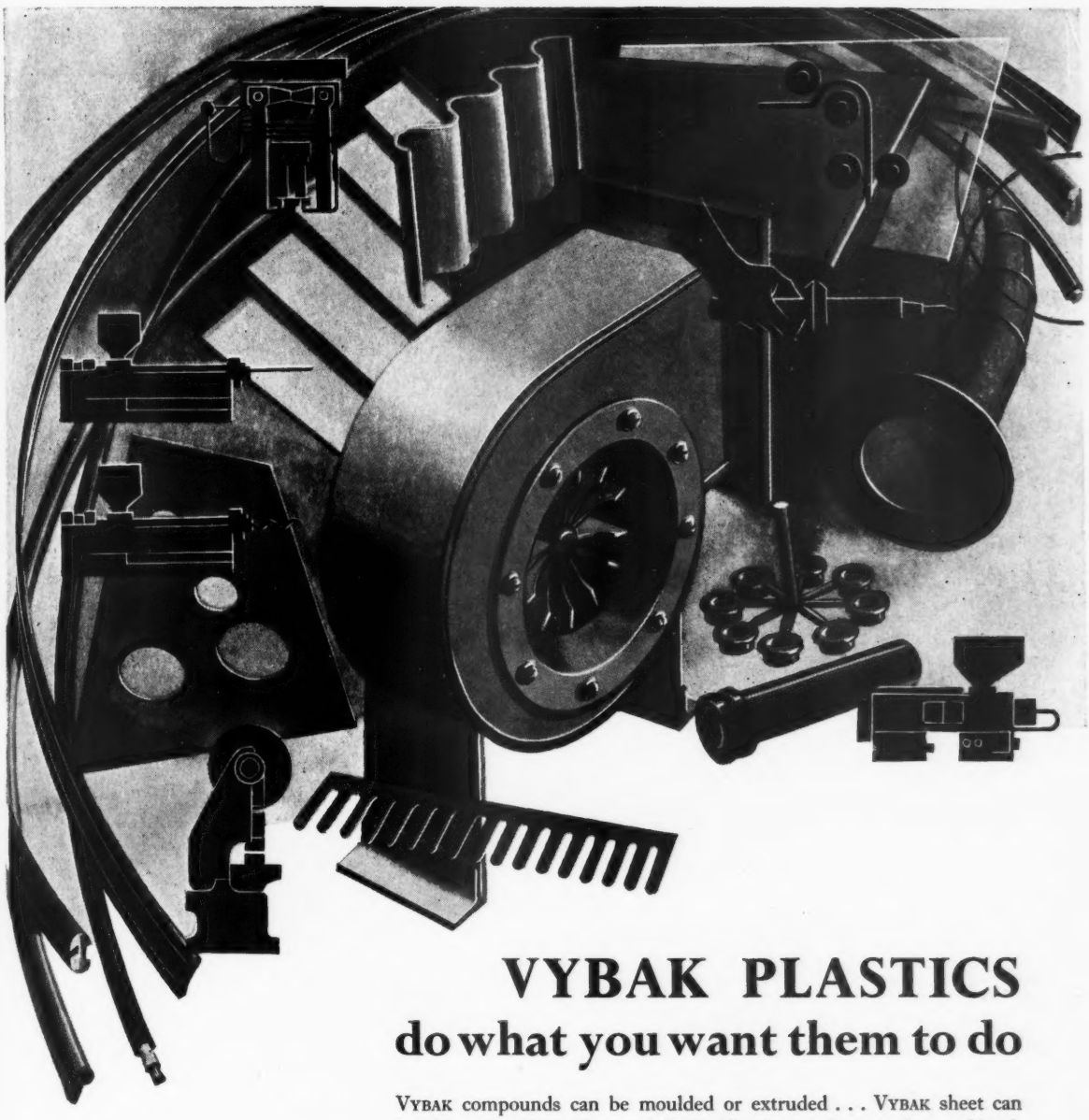

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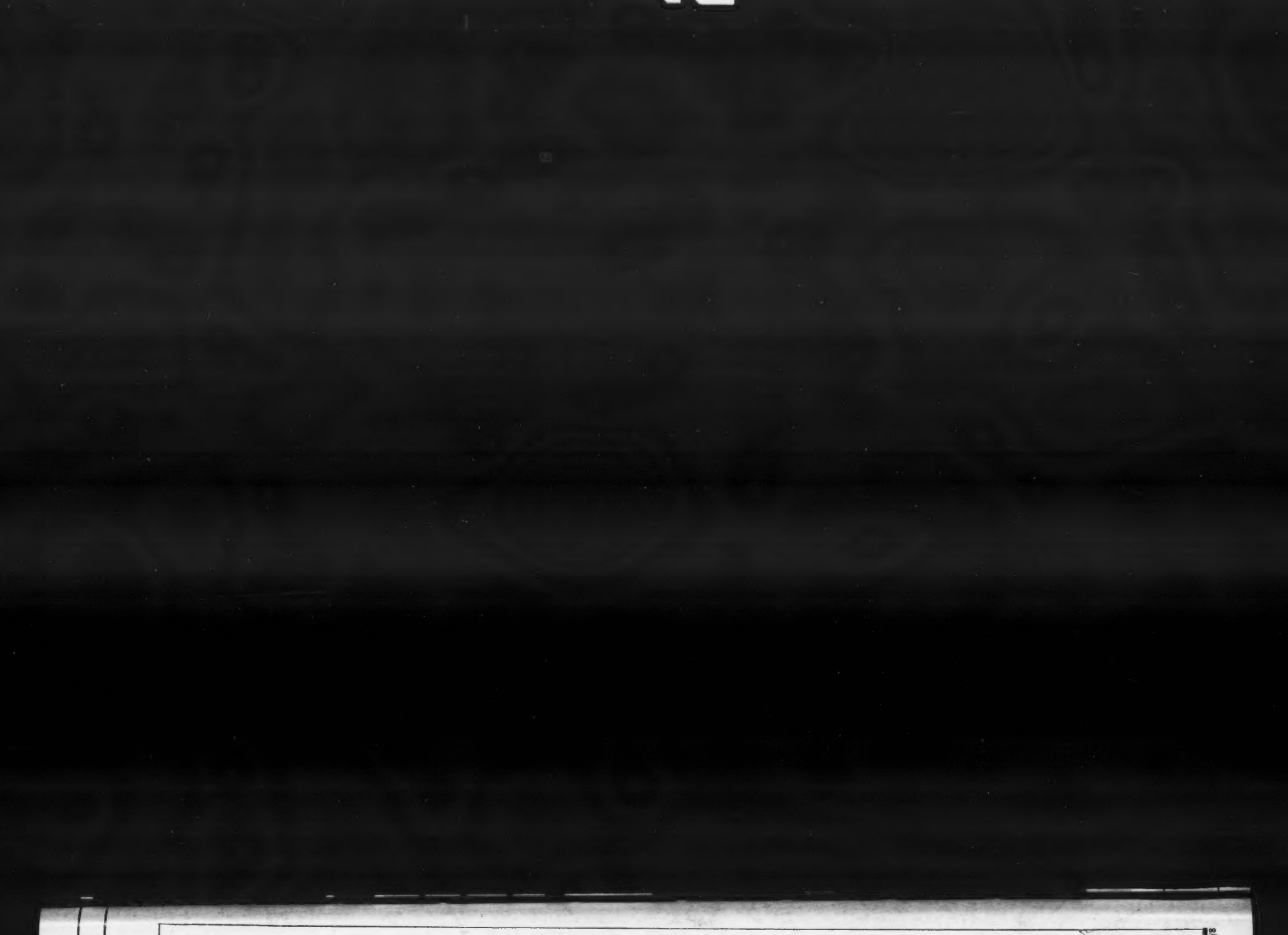
SP/BP/8